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- - TO - -
SOUTH AFRICAN MINING JOURNAL,
JOHANNESBURG.

Vol. XXIV. Part I. September 5th, 1914 to February 27th, 1915.

136744
10/9/15

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THE SOUTH AFRICAN

Mining Journal,

WITH WHICH IS INCORPORATED

South African Mines, Commerce and Industries.

ESTABLISHED 1891.

VOL. XXIV., PART I.] SEPTEMBER 5, 1914. [No. 1197.

HEAD OFFICE: 176-180, Stock Exchange Buildings, Fox Street (2nd Floor), Johannesburg, Union of South Africa.

Telephone **913.** P.O. Boxes **963** and **418.**

Cable and Telegraphic Address: "**MINING JOURNAL.**"

AGENTS FOR GREAT BRITAIN: Argus Printing and Publishing Co., Ltd., Byron House, 82-85, Fleet Street, London, E.C.

GERMAN AGENTS: H. C. Wolff, Gerberstr, O. 11, Kempten, Bavaria; Emil Karst, Steinstrasse 44, Leipzig.

AMERICA: Advertisements accepted from any recognised Advertisement Agency.

ANNUAL SUBSCRIPTION RATES: Oversea, £2; South Africa (by post), £1 10s.; Local Delivery (Town only), £1 6s.

Copies of this journal are obtainable at all Branches and Agencies of the Central News Agency, Ltd., at all News Agents and Railway Bookstalls throughout South Africa, and at the London Agency as above.

NOTICE.—The postage of this issue of the *S.A. Mining Journal* is: South Africa, ½d. All other parts, 1d.

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Notes and News.

Roodeplaats (De Beer).

The *London Gazette* states that at an extraordinary general meeting of the Roodeplaats (De Beer) Diamond Mines, Ltd., held on the 24th ult., at the offices, 3, London Wall Buildings, E.C., a resolution was passed to the effect that the company could not, by reason of its liabilities, continue its business, and that it was advisable to wind up. Mr. J. C. Roffey was appointed liquidator, and a meeting of creditors is to be held at 73, Moorgate Street, E.C.

* * * *

Cut Cables and Wireless.

Two important cable lines have been severed, but they are the property of the German Atlantic Company, and run from Emden to the Azores, proceeding thence to the United States. It is difficult to say how many lines are actually in use across the North Sea, but the total is undoubtedly very large. They are for the most part the joint property of the French and English Governments, although, of course, there are other Continental countries which have their own lines there. The whole of these are, however, well known to the English authorities and can be located if necessary. For purposes of the present military operations long-distance communication is being kept up almost entirely by means of the "wireless" system, and the results so far obtained justify the retention of this method of maintaining touch with the allies on the Continent and with our armed forces on the East Coast and at sea.

* * * *

The "Klerksdorp Record."

Congratulations to our valued contemporary, the *Klerksdorp Record*, which has been celebrating its 25th birthday. An interesting extract from its reminiscences of the western dorp a quarter of a century ago is as follows:—"The activities of the company and syndicate promoters may be realised from the fact that in 1890 there were in this district 24 gold mining companies, one brick and tile company, one hotel company, one offices and chambers company, Stock Exchange Co., 47 gold mining syndicates, and one diamond mining syndicate, the shares of which were all dealt in on the local Exchange. From the Exchange list of the week ending August 29, 1899, published in the *Record* of the 31st, we find the following quotations: Buyers—Ada May 11s. 6d., Ariston 12s. 6d., Buffelsdoorn 23s. 3d., Elandslaagte 7s. 6d., Hartbees Union 11s., Klerksdorp 16s., Gold Estates 32s., Klerksdorp Main Reef 34s., Stock Exchange 33s., Nooitgedacht 45s., New Nooitgedacht 21s., Nooitgedacht Victoria 6s., Nooitgedacht Extension 7s., Orkney 15s., Rietkuil Kopje 14s., Worcester Hope 12s. Syndicates—Banket Sheba £27, Eclipse Extension £21 10s., and Foxdale £31. The prospects of the town and district were very rosy at this time, but the Great Slump of 1890 altered matters completely."

* * * *

The Stock Exchange Outlook.

The prospect of the re-opening of the Johannesburg Stock Exchange is, of course, bound up with the possibilities of re-starting the London Stock Exchange. In regard to the latter, the views of a London correspondent are, therefore, noteworthy. There is every reason to believe, he writes, that the Committee of the Stock Exchange will not re-open the House until the financial requirements of the Government render such a course inevitable, and, even so, operations will only be resumed on a partial scale—that is to say, only in those markets in which there is a pressure to deal will any activity be shown. Even then the probability is that the auctioneer's method of dealing will be adopted. That is to say, persons wishing to sell will, after placing a reserve on their stock, put them up to general bidding, and, if the minimum price is not realised, will withdraw them. As a matter of fact, this is the only course possible under such conditions as prevail at present. Certain markets have already made representations to the House that in no circumstances do they wish transactions in their particular section of the House to take place, in view of the fact that a position has arisen which renders is impossible for intrinsic merit to be represented by actual quotations, and one can readily sympathise with those who hold this view. In the opinion of experienced observers, it will be some time before free markets are once more restored in Throgmorton Street, the situation in the meantime being governed almost entirely by the course of the war. Without doubt, if a decisive victory, either on land or sea, were secured by the Triple Entente an immediate response would be reflected in Stock Exchange values. Until, however, something of this nature has occurred the course of markets, when they re-open, must be regarded as extremely uncertain; in these circumstances the majority of members are undoubtedly in favour of a continued abstention from business. The Committee will, of course, weigh up the pros and cons of the situation and come to their own conclusion, but, if they obey the behest of the majority of their constituents, they will be in no hurry to resume business.

* * * *

Company Meetings and the War.

A movement is afoot in London to obviate the legal necessity for holding annual company meetings in the present crisis, and the privilege might usefully be extended to South African companies by the Union Government. In support of the proposal a correspondent this week writes to a London contemporary:—

> In the interest of the investing public and also of the directors and officers of all limited liability companies existing in the country at the present moment, I think it desirable to draw your attention to a situation which arises out of the present international and political situation. According to section 64 of the Companies (Consolidation) Act, 1908, it is necessary that a general meeting of every company shall be held once at least in every calendar year, and not more than fifteen months after the preceding general meeting. If such meetings are not held, the directors, managers, secretaries and other officers of such companies are liable to fines not exceeding £50. Under the existing conditions, it is practically impossible for such limited companies to hold their meetings owing to the absence of directors, managers, secretaries and other officers, who, like all other loyal subjects, are tendering their services to their country. In addition to this, many shareholders are occupied in a like manner, consequently, to hold such meetings during the existing conditions, may, in many cases, be impossible, and in other cases would be inadvisable in the interest of the investing public. Having regard to those conditions, I suggest that the Government should either pass a short Bill dealing with this situation or advise the Registrar of Joint Stock Companies to extend the hand of leniency during the ensuing two or three months. It may appear, at first sight, that this is a matter too trivial for consideration, but if considered in the interests of those connected with company practice in the City of London and elsewhere, I feel sure it is a subject which will be deemed deserving of attention, and I suggest that the publication of this letter will draw forth from proper quarters such protection as I suggest is desirable.

* * * *

Britain's World-Wide Levy for Food Supplies.

A cursory examination of the valuable recent "Food Number" of the *Times* shows clearly the enormous magnitude and value of the British home market, and the almost unique extent to which the home country is dependent on sea-borne supplies. It would be impossible to demonstrate more strikingly the consequent vital importance of ensuring adequate protection for British ocean transport trade, and the great possibilities ahead for the Dominions in supplying the necessary food products to meet the needs of the constantly rising population. From this investigation of the world-wide sources of supply of food imports it is certainly gratifying, says the writer, "to know that of the £274,228,000 thus expended, no less than £80,291,000 already goes to the credit of imports from British possessions, the productive resources of which should, nevertheless, be equal to their securing a still larger share in the sum total." In round numbers the values of food imports during 1912 from the various chief sections of the Empire were: India, 25 million pounds sterling; Canada, 21 millions; Australia, 14 millions; New Zealand, 10 millions; Ceylon and dependencies, 5 millions. South Africa is described as at present a land of promise rather than one of great performance, but there is good reason to anticipate substantial improvement, of which, indeed, there are already many reliable indications. Other parts of Africa and the islands off the coasts consigned large quantities of fruit, sugar, and spices; and Egypt sent us nearly a million sterling worth of food of various kinds. Imports from the West Indies reached a total value of nearly a million and a half sterling. The many agencies which are now actively at work drawing the attention of home merchants and consumers to the excellent quality of Empire-grown food products, the improvements constantly being achieved in processes of packing and preservation, and the growing facilities for rapid and direct transport, not only to London but also to other great consuming and distributing centres in the west and north-east, should ensure that as these annual reviews are compiled in the future they will show a marked increase in the proportion of British food imports derived from lands under the flag.

* * * *

The Passing of the "Rhodesian Mining Review."

Our sympathy goes out to the *Rhodesian Mining Review*, which has been usefully and honourably conducted in the interests of Rhodesian mining, on its cessation with the last issue. In taking its leave, our contemporary says:—"With much regret, but with many and sincere thanks to past and present supporters, advertisers and readers alike, we have, after rather more than a five years' lease of life, to announce the closing down of the *Rhodesian Mining Review*. Our journal came into being at a time when there was great activity, both in the field of actual operations and in the share market, in the mining affairs of Southern Rhodesia; at a time when there was no lack of support from the points of view of circulation and advertisement revenue, and when, in exchange for these, we were easily able to give a useful service of news. We had hoped to found a journal which might have proved itself of permanent help to the mining industry. In the event, although Rhodesia's chief stand-by has unquestionably made great strides since the first issue of this paper, and as unquestionably is continuing to make a very real measure of progress, it has appeared that the time has nevertheless not yet arrived when a local newspaper dealing alone with the technical or sectional affairs of mining can make its unaided way." We can only add that the place left vacant the *South African Mining Journal* will attempt to fill by devoting in future increased attention and space to the progress of Rhodesian mining.

* * * *

Financial Strength of Great Britain.

The last circular issued by a well-known Edinburgh stockbroker contains the following passage:—"As a matter of fact, the financial situation in Great Bhitain was, owing to the practical absence of speculation for some time past and the extent to which weak positions had already been liquidated, very sound. It is the Continent, where capitalists' resources were already to so serious an extent tied up in non-realisable obligations, that was mainly responsible for the demoralisation of markets. But if things have been so bad on the fear of war the possibilities if it becomes an actuality can only to imagined. Again, however, the danger of a serious credit breakdown is chiefly on the Continent. Credit in this country is generally sound, and the banks are likely to meet the situation in a level-headed manner. Any suggestions to investors while it is impossible to deal are, of course, useless; but it may be observed that though, if the Stock Exchange re-opened, prices might fall lower, there is a wide choice of securities the intrinsic merits of which a war in Europe would by no means adversely affect, but which, owing to sales made not of choice, but of necessity, have been knocked down to a quite unreasonable extent."

* * * *

Mining Engineers and the War.

Mining engineers, and particularly members of the Institution of Mining and Metallurgy, will be glad to hear that it is proposed the Institution should form a Volunteer Corps to be placed at the disposal of the War Office for special home service. Appended is the text of a letter signed by Dr. F. H. Hatch, the President, and Mr. C. McDermid, the Secretary, which is being sent out to members of the Institution from the offices at 1, Finsbury Circus, E.C.:—

> Proposed Volunteer Mining Engineers' Corps.—Dear Sir,—A proposal has been made (and communicated to the Secretary of State for War) that the Institution should form a Volunteer Corps to be placed at the disposal of the War Office for Special Home Service. A considerable number of Members and Associates of the Institution have urged the desirability of this step, and have already offered their services. If you wish to join such a corps, in the event of the offer

being accepted by the War Office, will you please at once communicate with Mr. McDermid.

The membership of the Institution of Mining and Metallurgy is now well over 2,000; at the end of last year the exact number was 2,372. A large proportion of the total is no doubt represented by men engaged in mining or metallurgical operations abroad, but in all probability the present home list includes quite sufficient to form a useful corps. Mining engineers are accustomed to having to adapt themselves to unusual conditions, and their technical training might easily be found of service by the War Office. Some of them, we know, would like to have the chance of rendering service abroad to the British war authorities, and it is also noteworthy that the desire to do something to assist Great Britain is not confined to mining engineers of British nationality, but is shared by members of the American mining fraternity. The reply from the War Office to the proposal is as follows:—

> War Office, 5th August, 1914.—Dear Sir,—I am very much obliged to you for the proposal you have made to the War Office to create a special corps of mining engineers. The time is not ripe to give you a definite answer whether or not we shall be able to avail ourselves of it, but I need hardly say that we are very glad to know that such a scheme is capable of being set on foot, and I shall not fail to bring it to the notice of my colleagues on the Army Council in order that we may avail ourselves of it should the necessity arise.—Yours faithfully, (Signed) H. J. Tennant.

We also understand that on behalf of the committee of the Mining and Metallurgical Club, Mr. Edgar Rickard, the President, has sent a letter to the Lady Mayoress, at the City of London branch of the British Red Cross Society, offering the premises of the club in response to her request for the loan of suitable halls and buildings within the City which may be utilised in case of necessity as temporary hospitals. The club's premises at No. 3, London Wall Buildings are extensive—they cover an area of about 6,000 square feet—and are said to be admirably suited for the purpose in view.

* * * *

How You Can Help.

Some of the advice given by the English papers to the public in the present time of trial may usefully be quoted as equally applicable in South Africa. Here are a few specimens:—"Though you are not a soldier, you can help to defeat the enemy in many ways. If you cannot join the Army, you can keep a cool head, and help others to do the same, and thus preserve an orderly calm throughout the country. You can refuse to store up extra food in your homes, and thus keep down prices. High prices mean starvation for the poor, and a greater problem for the Government. You can, if your are wealthy, refuse to hoard up gold in your homes, and thus save a run on the banks, which will only mean reduced credit and disturbance of the trade and industry of the country. You can join one of the ambulance associations, and so get proficiency in nursing. Or you can, perhaps, join the local branch of the great national organization which is being formed, at the suggestion of the Government, to deal with the distress resulting from unemployment. You may be able to find someone in distress, or help in the distribution of food, either of your own surplus stores or that of the national organization now being formed. You may be able to find work or odd jobs for some of the workers—man or woman—or you may have some spare clothing to give to needy people. Above all, exercise great care in the use of foodstuffs, and see that there is no waste of any kind. This done throughout the country means that the national food supply will last all the longer, and help to keep food prices down. If you are an employer think of your employed. Give them work and wages as long as you can, and work short time rather than close down, and thus reduce the difficulties of the Government. Instead of dwelling on your privations, think of the infinitely worse state of those who live at the seat of war, and are not only thrown out of work but deprived of all they possess. Do what you can to cheer and encourage our soldiers. Gladly help any organization for their comfort and welfare. By doing these things you help the country to go forward smoothly, to keep trade going, and thus help to finance and feed the Navy and Army. In other words, you will help to defeat the Germans, whose trade is now at a standstill, and who will be automatically crippled by a prolongation of the war over many months.

TOPICS OF THE WEEK.

THE MINING INDUSTRY AND THE WAR.

The end of the first month of the war sees the gold mining industry of the Rand maintaining an eminently satisfactory position. Interviewed on Thursday by a representative of this journal, Mr. E. A. Wallers, the President of the Chamber of Mines, said: "The position of the industry to-day continues to be satisfactory. Adequate supplies are available for all purposes. Nothing is being left undone to guard against a shortage of any of the necessaries of production. Ample supplies or cyanide, zinc, and mercury seem assured, and further shipments are now coming forward. All this, of course, refers to the not-too-remote future. What may happen should the war be indefinitely prolonged, of course, I cannot say. It is enough that everything humanly possible has been done to safeguard the industry against any restriction of operations. In saying this I must not forget to mention how much we owe to the Union Government. By its action in arranging with the Bank of England in regard to the gold output, and in its businesslike grasp of the complications of the position, the Union Government has helped us in the most effective manner." In reply to a request from us for his views, Mr. W. H. Dawe states:—"I see no reason for uneasiness in regard to the continued working of the gold mines. Two of the most important questions which the industry had to deal with were: (1) Realisation of gold produced; (2) supplies. The first was arranged through the co-operation of the Government, Banks and Chamber of Mines with the Bank of England, whilst the second has been dealt with in an equally satisfactory manner." So much for the Rand mining industry as a whole. Another side of the picture is, however, reflected in the views with which Mr. William Pott, of Henderson's Consolidated, has favoured us. Mr. Pott says:—"I expect collieries will not decrease their scale of work. It is possible, Argentine being cut off from Welsh coal, may come to us for supplies which might mean an increased demand. As to gold mines, such a company as 'Daggafontein' which is shaft sinking and has not yet made financial provision for development works, I fear, unless Government or the Banks can lend some financial assistance till times are normal, may perforce have to cease. Revenue producing mines ought as a rule to be able to maintain work, and it is in the public interest that they should do so in every possible case." The foregoing valuable and informative expressions of opinion will be supplemented in our next issue by a further selection of representative views.

ARE WE GERMAN-CONTROLLED? A GROSS LIBEL ON THE RAND.

Self-interest masquerading as high-souled patriotism is one of the commonest of funguslike growths that flourish in times of national stress and trial. An unwarranted attack on Rand directorates by one who should know better is the latest example of this type of libel. We may say at once that we refer to the fact that London papers have received the following letter from Mr. Francis J. Dormer, who is described as Chairman of the Transvaal Estates and Development Company, a member of the London Committee of the New Heriot Gold Mining Company, and a Director of the Village Main Reef Gold Mining Company: "It is in the national interest imperative that the mining industry of the Rand now controlled in all essentials by Germans, although their personal and national stake in it is relatively very small should come without delay under the supervision of representatives of the English and French citizens to whom the property almost wholly belongs. The maintenance of the gold supply, the handling of vast sums of money, the placing of valuable orders and the general patronage associated with the industry, now and in the time to come, are among the obvious considerations that point to the wisdom and urgent necessity of the change suggested. There are, however, other and equally cogent considerations which it is not at this moment expedient to state. I should be glad if those who share my views and are prepared to co-operate in taking the necessary action will enter into communication with me without delay, indicating the companies in which they are interested and the number of their shares.—I am, etc., Francis J. Dormer." Now, the simple fact is that the whole premises on which this appeal is based are false—the mining industry of the Rand is not controlled in all essentials by Germans. We who live on the Rand and come into constant touch with the leaders of the industry know how little truth there is in the allegation. Directors with German names we certainly have in our midst. But they are very few, and they most emphatically do not control the industry. We all know that German financiers were associated with the beginnings of the Rand, but they almost invariably and inevitably became British subjects, identifying themselves with the aspirations of the British people and ended by being "more British than the British themselves." Their princely generosity has endowed British universities; their benefactions have enriched British charities; their sons are to-day fighting side by side with the best and noblest of Britain's sons. The German Empire's loss is the British Empire's gain. To condemn these men as Germans in order to gratify some one's personal spite or ambition is unfair and un-British. That the industry is run by, or in the interests of Germans, the people of the Rand can judge for themselves. They know how the directorates of the mines have behaved in this as in other great crises. Money has been poured out in every national emergency to help the British cause and the men on the mines can bear testimony to the treatment they have received when volunteering for the service of the Empire. Pages might be written, and the whole history of the Rand called up to prove how far wide of the mark is Mr. Dormer's splenetic outburst. Apparently, however, his tirade of abuse is meant for home consumption. On the Rand, at least, it "won't wash." With such names as Farrar, Chaplin, Wallers and Dalrymple occupying the leading positions of the industry it is manifestly unwarranted to impugn its loyalty and patriotism as "German-controlled."

THE DOMINIONS COMMISSION ON THE UNION PORTS.

THE fact that the interim report of the Dominions Royal Commission dealt mainly with the mining industry must not obscure its important references to the question of Union ports and shipping. "Situated as the Union is half-way between England and the other Dominions of the southern hemisphere," says the report, "and on a sea route to India which is the only alternative to that by the Suez Canal, its harbours have, in an especial degree, an Imperial interest." The Commission's Report is by no means uncomplimentary in its references to what has been done in the past. "At Durban in particular much enterprise has been shown. Starting in 1860 with a depth of 12 inches only on the harbour bar at low water, the authorities have now created an admirable port, capable of accommodating the largest vessel on the Australasian route. We were informed indeed that the Ceramic, the largest vessel now running to Australia, was more difficult to bring into Tilbury than into Durban. We consider that the Capetown authorities have met the problem of harbour development in a wise and statesmanlike manner. This year the port will be able to accommodate the Ceramic with a draught of 31 feet 6 inches." So far so good: but the far might be farther, and the good might be better. Already about 75 per cent. of the total outward traffic from the United Kingdom to Australia and New Zealand, and 32 per cent. of the homeward traffic, at present pass by way of the Cape of Good Hope. Nevertheless the respectable total of 1½ million tons at present pass through the Suez Canal en route between Europe and Australia. "If in past years, when only vessels of 26 feet draught could pass through the Suez Canal, the South African authorities had realised the advantages which deep water harbours could have given them, it is certain that the proportion of traffic using the route via the Cape of Good Hope, high as it is, would have been substantially increased." Therefore the Commission urge the wisdom of a bold policy in the future. Without going into the rival merits of the Union ports and into those of Delagoa Bay for the purpose of local traffic and local development, the Commission are strongly of opinion that "the improvement of Capetown and Durban to the level of first-class harbours is in the interest both of South Africa and of the Empire." Jealousy between these two harbours is deprecated. They "should be regarded less as rivals than as jointly interested in improving the South African route, and in attracting to it all the traffic available." At the same time, in the case of Capetown, we are told that "the work of improvement has real urgency in view of its geographical position." This passage may be commended to the attention of the Capetown Chamber of Commerce. As matters stand, to judge by the evidence of witnesses quoted by the Commission, "real urgency" is likely to be interpreted in a somewhat leisurely fashion. It seems that "extensions immediately in hand" are expected to provide accommodation in 2½ years for ships—how many is not said—drawing 36 feet 6 inches: while a scheme has been "prepared and submitted to Government" involving the expenditure of some £3,000,000, spread over 10 years, and the construction of eight berths with 40 feet of water. As to Durban, we are told of a project "by means of reclamation work to provide fourteen berths, each with a depth of 40 feet." No figure of cost is given: but the provision of a 40 feet channel to the 40-feet berths is estimated to cost two millions sterling. The returns of the last few years show that the number of vessels calling at Durban is rapidly increasing. It rose from 271 in 1912 to 370 in 1913. It is not clear, however, that the need for deep harbour accommodation is greater at Durban than in Table Bay; for the tonnage of the 315 vessels which called at Capetown in 1913, was greater than the tonnage of the 370 vessels which called at Durban. The Commission say nothing about the proposed expenditure of 1½ million sterling on a breakwater at Port Elizabeth: but we may infer what their opinion would be from their remark that nothing which can possibly be done at any of the other harbours of the Union, or at Delagoa Bay, can have the same effect as the speedy provision of deep-water accommodation at Capetown and Durban in attracting to South Africa traffic which, in the absence of such facilities, must otherwise be lost to it. As regards the mail steamers, the Commission observe that the present contract for the carriage of South African mails compares favourably with other mail contracts, though greater speed is desirable, and the advantages of the subsidy system are countered by serious drawbacks. In any case the development of the harbours in such a way as to attract the big Australian liners cannot be otherwise than useful. It is odd, as the Commission remark, that "the transport of mails between England and South Africa has been organised hitherto as if Australia and New Zealand did not exist, and the mail service between England and Australia and New Zealand organised as if South Africa did not exist." This though the direct route from the United Kingdom by way of Table Bay to Adelaide is only 600 knots longer than that by Gibraltar and the Suez Canal. It is reasonably suggested that in all future mail contracts affecting either Australasia or South Africa it would be advantageous if there were consultation, not only between the British Government and the Dominion Governments but between the Dominion Governments themselves.

German Banks in London.

It is noteworthy that the only banks which did not open in London in mail week were the branches of the big German banks—namely, the Deutsche Bank, the Dresdner Bank, and the Direction der Disconto Gesellschaft. On the door of the Deutsche Bank the following notice was posted: "Owing to the state of war business is necessarily discontinued until our application to His Britannic Majesty's Government for a license has been granted." Similar notices were posted on the doors of the other two German banks.

POSITION OF ZAAIPLAATS TIN.

Milling Temporarily Stopped-But Development Proceeding.

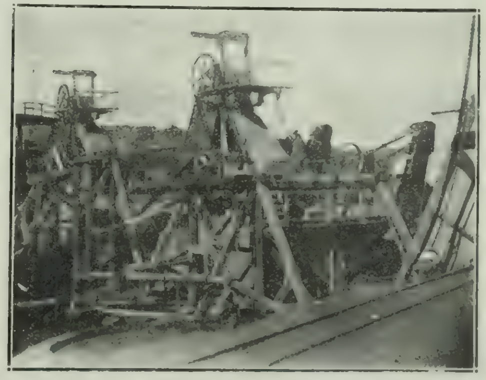
The position at Zaaiplaats is that milling has stopped temporarily, but development work is being continued. In the quarter ended 31st July, 1914, 15 stamps ran 61·2 days, crushing 9,597 short tons, the duty per stamp being 10·3 tons per 24 hours. In addition, 4,610 short tons of sands and slimes residues were re-treated, while the alluvial plants dealt with 20,178 tons of overburden. The output for the quarter amounted to 292 long tons of concentrates, assaying 68 per cent. met. tin, as compared with 297 long tons produced during the previous quarter. The estimated profit for the quarter amounted to £4,907 11s. 3d., made up as follows:—Estimated profit for the three months' operations, £4,967 14s. 1d.; less adjustments of estimated values of shipments to 21st April, 1914, £60 2s. 10d.; profit declared for the quarter, £4,907 11s. 3d. (N.B.—At the close of the quarter there were 12 tons concentrates on hand which have not been sold owing to the closing of the Metal Exchange in London. This tonnage has not been taken into account in the above statement of profit.)

No. 2 Section. A connection was made between Nos. 2 and 3 Sections, enabling the resumption of work in the latter. The work has been confined to the exploitation of several small high grade branches. No. 5 Section. This section has been productive of an abnormal amount of high-grate ore owing to the discovery of new branches. The hanging wall branches have proved more persistent than those in the footwall. No. 6 Section. Since its association with the fissure the main ore body in this section has improved, and during the latter half of the quarter ore above the average grade was being worked. No. 13 Section.—Work is at present being confined to the first level ore body, which has proved itself to be the main occurrence. This body continues as a shoot on the fissure plane, and has yielded a normal tonnage of high-grade ore. Favourable developments took place in a large branch 500 feet down from the surface, which has been worked for over a year. No. 20 Section.—This working was reopened. The main body consists of a lense 8 inches in diameter of average grade. No. 6 Roodepoort. The ore having become increasingly erratic, work was suspended. During the quarter 13.373 tons of ore were mined and disposed of as follows: Apportioned to Transvaal Consolidated Land Company, 138 tons; waste sorted, 1,418 tons; sent to mill, 9,597 tons; total, 11,153 tons; added to reserve dumps, 2,220 tons; total, 13,373 tons. No discoveries of importance were made by surface prospecting. The concentrates won from the treatment of the overburden by the alluvial plants amounted to 35 long tons, averaging 67·9 per cent. metallic tin. The "Deister" and "Isbell" dressing and treatment tables have been erected and are giving satisfactory results. Further alterations were made for the improvement of washing and dressing operations. The net expenditure charged during the quarter to capital account amounted to £736 0s. 7d., made up as follows: Machinery and plant, £123 13s. 11d.; reservoirs, dams and water service, £612 6s. 8d. The supply of native labour has been regular, and no difficulty has been experienced in maintaining the full complement. Rain fell on three days during the quarter and amounted to 0·74 inch. The water supply was sufficient for the company's requirements. No dividend was declared during the quarter. The following announcement by the board appeared in the Press on the 14th ult.: "In view of the position of affairs in Europe, the directors have decided to reduce milling operations and to carry on only important development work in order to conserve the company's cash resources as long as possible. Satisfactory arrangements are being made to retain the European employees on the property." Advantage will be taken to effect certain necessary repairs to the battery and crusher station, which have been running for a considerable period without stoppage.

MODERN DIAMOND PLANT.

Successful New Ideas Exemplified at the Premier and New Eland Mines.

In view of the revolutionary changes now making their appearance in the style and nature of diamond mining plants, especially that portion relating to the treatment of the ground after it comes from the mine, it is necessary that all those interested in diamond mining propositions should make a thorough investigation of the merits of the up-to-date methods, before committing themselves. So different is the nature of the ground in the many occurrences of the diamond that it appears impossible that any one machine can be made to suit all of them. The success, or otherwise, of a proposition, therefore, may easily depend entirely upon the type of plant adopted for extracting the diamonds. The extended knowledge of the expert to-day compels him to unlearn many of the old lessons, and to deal with each case upon its merits. This often involves very sharp departures from the old orthodox. The old rotary machines do not appear to find such favour as formerly, and this is possibly accounted for by the fact that the tailings from these machines have been found to contain diamonds in very appreciable quantities, almost without exception. Messrs. James West & Co., of 186, Stock Exchange, Johannesburg—with whom is associated Mr. J. E. Jones, well known at De Beers and the Premier—appear to be keeping well abreast of the times, and most of their latest details, we understand, are made the subject of patents. The success of their new ideas is exemplified in the plants erected at the Premier mine, and still later at the New Eland Diamond mine. In the latter case the entire plant was erected by contract by Messrs. West & Co. from their own special designs embodying the very latest features. One of the main points is the lowness of the working pieces. The tale of its success is best told by the well-known authority on these matters, Mr. T. C. Ferreira, at present pulsator manager at the Premier mine, who says:—"I was recently at the New Eland Diamond mine at the request of Sir Thomas Cullinan, and I inspected the direct treatment crusher-pulsator plant recently erected for the Company by you. I examined the gear whilst it was working on both blue and yellow taken direct from the mine. I also examined the different details when the gear was stopped at the close of the shift. It is gratifying to be able to record that I was very pleased with the general arrangements and details, as well as with the satisfactory way in which everything was working. In fact, so satisfactory was everything that I did not suggest any modification or alteration.—Yours, faithfully, (Signed) T. C. Ferreira." The monthly results of the washing published by the company quite justify Mr. Ferreira's remarks.



THE ECONOMICS OF PRESENT DAY WARFARE.

A Brief Summary of the Striking Arguments Adduced in Mr. Norman Angell's Famous Work, "The Great Illusion."

The war lends extraordinary interest to the facts adduced in the famous work by Mr. Norman Angell on "The Great Illusion" of a European conflict. The object of the book is to show that the whole of Europe, and indeed the civilised world, is suffering from grotesque optical illusions about war. The writer sets out to show that the gigantic system of armaments by which nations suppose themselves to be protecting themselves, their territory, and their commerce is the survival of a state of things that has long ceased to exist. Each nation pleads that its armaments are for defensive purposes, and that implies the widespread belief that military and political power give to a nation commercial and social advantages, and that the wealth and prosperity of a defenceless nation is at the mercy of the stronger nations who may be tempted by such defencelessness to commit aggression. So familiar are people with the idea that wealth and trade are dependent upon, and in proportion to the size of, army and navy, that it comes as a shock to the reader to find that Norman Angell challenges the position, and arrays conclusive facts and figures. He shows how it would be impossible for any country in the civilised world now to gain by invasion or the occupation of any other country, seeing that wealth no longer consists in bullion and objects that could be carried away. Wealth consists in securities and world-wide undertakings, the value of which depend upon credit and mutual trust. He shows how if Germany should seize and loot the Bank of England the action would recoil in such a manner that no considerable institution in Germany would escape grave damage out of all proportion to the loot seized, for every pound taken from the Bank of England German trade would pay a thousand. It is impossible to trace all the steps of so closely-reasoned a book, and the work must be read for all the conclusions to be accepted. The only gain possible to a country by conquering another is where that other is uninhabited, undeveloped, or in possession of uncivilised or savage races. Britain gained elbow-room for her surplus populations in her colonies, but what she gained for herself she has gained equally for others. A German coming to Africa enjoys the same privileges and opportunities as a Briton: he pays no more taxation, can acquire land, trade as freely, whilst the burden of conquering South Africa cost Britain two hundred and fifty million pounds and thousands of lives. In "The Great Illusion" it is shown that small countries with few or no armaments, just enough to act as a police force, are actually able to compete successfully with the greater countries, and in many instances the trade done by the smaller countries is greater per head of the population than that done by great nations which weigh themselves down by gigantic armies and navies. Norway, with no navy to protect its shipping, carries three times as much as does Britain. Dutch, Swiss, and Belgian merchants, with no army or navy worth speaking about, are able to compete successfully in all the markets of the world with the merchants of Germany or France, protected by great armaments. The Dutch citizen is better off than the German citizen, and a great deal better off than the Russian citizen. Dr. Bertillon, the French statistician, made elaborate calculation of the relative wealth of individuals of each country, and the middle-aged German possesses on an average, £360, whereas the middle-aged Hollander possesses nearly twice as much: that goes to prove that the individual citizen of the undefended nation is better off than the citizen of the greater nations, whose soil and wealth are defended by great armaments. The citizens of Holland, Belgium, Denmark, Sweden and Norway, as regards the amount of money in savings banks, standard of living, social progress, general well-being, are in many respects better off than those of Germany, Austria, and France. Financiers clearly regard the almost unprotected countries as much securer for their investments. At the time the book was written, a hundred pounds' worth of stock at three per cent. cost £96 in Belgium, but could be purchased for £82 in Germany; a hundred pounds' worth of stock at three-and-a-half per cent. cost £102 in Norway, but could be got for £81 in Russia. Further quotations from the book might be given showing that one country can never be rightly said to possess another. South Africans are bound to the Homeland by ties of friendship, blood, interest, and sentiment. So deep was that love that the vast majority were ready to give lives and treasure for the Motherland, but Britain does not truly possess South Africa. She does not impose taxation, or dictate laws, or command even in war time the support that is so freely given. In mediaeval times conquest meant gain, or advantage to a reigning house; now when a state or province is annexed the population who are the real and only owners of the wealth therein, are also annexed, and the conqueror gets nothing except prestige, anxiety, and responsibility. The intelligence, efficiency, and industry of the people who live in a country constitute the wealth of that country. Germany in exacting an indemnity of two hundred millions from France in 1870 and annexing Alsace-Lorraine, made a very bad bargain. That indemnity impoverished her. Finance is already international, labour tends to become so, and a tendency which no one can ultimately prevent is carrying the world on to a brighter day when people will look with amazement and dismay at the folly of their ancestors who spent their time in preparing to fight, and provoked wars by their very preparation for them. Once the Kaiser (who is responsible for the present upheaval) has been utterly broken, it will be for all the nations to see that such a condition of things is rendered impossible in the future.

Coal Resources of the World.

The Queensland Government Geologist (Mr. B. Dunstan), in his progress report for 1913, has the following:—An enquiry into the coal resources of every country, made upon the initiative of the 12th International Geological Congress, has recently been carried out by the Government Geologists throughout the world, and the report of the investigations, consisting of three volumes of text and an atlas of coloured maps and plates, has recently been published under the editorship of officers of the Geological Survey of Canada. The text gives a mass of details bearing on the coalfields of each country, and includes a tabulated estimate of actual, probable, and possible reserves of coal, the atlas illustrating the location of the coal deposits of the world and their relation to one another. Of all countries the United States has far the greatest quantity of coal in reserve, and her present output is nearly equal to the combined production of Great Britain and Germany. The latter country has double the reserve of Great Britain in coals of all classes, but those of Russia, Austria, France, and Belgium are comparatively small. Canadian reserves are about one-third those of the United States and therefore greater than England or any other country in Europe. Asia is about equal to Canada in her coal resources, most of the coal lands being in China and India. Australasia is able to show a reserve nearly equal to that of Great Britain, even though large areas of coal measures remain unexplored and undeveloped. New South Wales takes the leading position in Australia with a reserve of about 100,000 million tons of coal, Queensland being next with 13,000 millions, the other States being far below.

THE DIAMOND DEPOSITS OF GERMAN SOUTH-WEST AFRICA.

History and Description of the Discovery—Extent of the Fields—Topographical Details.

[BY DR. PERCY A. WAGNER.][*]

WHEN in the middle of 1908 rumours of rich diamond discoveries in the coastal desert of German South-West Africa began to reach Cape town they were received with incredulity, for it seemed difficult to associate anything so beautiful as the diamond with the terribly inhospitable region which, in 1885, had been offered to the Cape Government and declined with thanks. However, for once in a way, the sceptics were mistaken, and the reports of responsible experts soon began to make it clear that Africa, proverbially the land of surprises since Pliny's famous dictum of two thousand years ago, had this time excelled itself. For that in the wildest parts of one of the most desolate and useless tracts of land which the earth can show, bare surfaces of rock should in places be as thickly studded with lustrous gems as are the show cases of a jeweller's window, surely puts to shame even the celebrated legend of Sinbad the Sailor. It is almost as if Nature, conscious of her injustice to this portion of the African Continent, had added the diamonds as an afterthought by way of making amends. The area had been traversed by several geologists and a railway constructed right across it, but no one had ever dreamt of looking for diamonds. The discovery was actually made in April, 1908, by a Cape "boy," a former employee of the De Beers Company, who, while working on the railway line in the vicinity of Kolmanskuppe, picked up several stones, which he at once recognised to be diamonds. The stones eventually got into the hands of a railway official of the name of Stauch, who, having ascertained that exactly similar crystals were abundantly scattered through a superficial deposit of a coarse gritty sand,[†] proceeded forthwith to peg off enormous areas of this material, thereby securing what is one of the most important holdings in the entire diamond field. Stauch's action did not at the time attract much notice, but about two months afterwards, when the opinion of the Cape "boy" was confirmed by Dr. Range, the Government Geologist, there was a great rush on the part of the inhabitants of Lüderitzort to participate in the wealth which had been literally spread out at their feet. In an incredibly short space of time all the ground open for pegging in the vicinity of Lüderitz Bay had been taken up, and some of the bolder spirits now began to organise prospecting parties, which, in the face of enormous difficulties, explored the desert in all directions, and were rewarded by the discovery of exactly similar deposits in the littoral, both to the north and to the south of the area in which the original finds had been made. The search was subsequently taken up by large expeditions sent out by the various companies which had been formed to exploit the gravel occurrences, and within eighteen months of the date of discovery the whole of the dreaded coastal belt between Walfish Bay and the mouth of the Orange River had been more or less thoroughly prospected. Attempts were also made by an enterprising syndicate to dredge the sea bottom off Elisabeth Bay and Pomona, until work of this nature was prohibited by an Imperial Decree, which vested all rights for the search of diamonds on the ocean floor in the Colonial Treasury. Whether any success attended the dredging operations is not known, but from the fact that diamondiferous gravel identical with that found on the mainland occurs on Possession Island it appears almost certain that submarine deposits exist.

THE EXTENT OF THE DEPOSITS.

The diamondiferous deposits, hitherto located within the littoral of German South West Africa, extend intermittently from Conception Bay, latitude S. 24 deg., to Angras Juntas, latitude S. 28 deg., a distance as the crow flies of about 270 miles. In no portion of this tract of country have the gravels been found at a greater distance than 12 miles from the coast, which circumstance, coupled with the previously recorded occurrence of diamonds on Possession Island, renders it clear at the outset that the deposits must in some way stand related to the sea. Owing to the small average weight of the diamonds which they yield, and their shallow and patchy nature, none of the extensive tracts of gravel between Lüderitz Bay and Conception Bay[‡] have as yet proved worthy of exploitation, and the following description concerns itself more particularly with the deposits situated to the east and south of Lüderitz Bay.

TOPOGRAPHY.

Within the area under review, the rock bound coast, swept by the powerful Benguela Current, rises rapidly from the sea, being in places bordered by precipitous cliffs up to 200 feet in height. Further inland one finds broad naked ridges and isolated chains of hills, with a prevalent north-to south trend, alternating with flat-bottomed valleys and hollows occupied by sand and detritus. To the east of Lüderitz Bay there is a considerable depression which extends from Gallovidia Bay, some miles to the north of Lüderitzort, to Elisabeth Bay; being traversed by the Keetmanshoop railway between kilometres 16 and 17. Within this depression and in a minor valley, by which—to the south of the railway—it is parallel on the east, are situated the important Kolmanskop, Stauch (Kolomale Bergbaugesellschaft), and Fiskus claims. Forming the eastern boundary of these claims is a mighty belt of sand dunes which stretches without a break from Elisabeth Bay to Walfish Bay. To the north of Lüderitz Bay the dunes extend almost in a straight line along the coast, and in several localities border directly on the sea. South of Elisabeth Bay, where a dry river bed coming from far inland enters the sea, the country assumes a more rugged character and in the Pomona area the diamondiferous deposits are confined to a number of persistent valleys hemmed in by steep sided hills. The entire coastal belt, for a distance of about 30 miles inland, is at the present day to all intents and purposes a rainless desert, practically destitute of vegetation, and before the discovery of diamonds shunned by mankind. The principal agency of denudation is a violent south wind which blows with terrific force throughout the summer months, and, as we shall persently learn, has been largely instrumental in the formation of the diamondiferous gravels. Admirable illustrations of wind erosion are in evidence on every hand, and there are probably few regions on the face of the earth where this form of rock sculpture in all its various aspects can be better studied.

GEOLOGY.

The geological formations entering into the structure of the area are as follows: Ancient gneisses and crystalline schists with intrusive granite; ancient limestones, quartzites and phyllites with intrusive foyaite; sandstones, grits, marls and clays of Cretaceous? and Tertiary age; recent deposits and accumulations of sand and gravel. The ancient crystalline rocks, greatly in evidence on the Lüderitz Bay fields, comprise gneiss, augen gneiss, amphibolite and biotite schist, which have been extensively invaded by granite and are much veined with aplite, pegmatite and quartz. To the south of Prince of Wales Bay the granitic and gneissoid complex is replaced by a series of limestones, quartzites, quartzitic conglomerates and phyllites which are also believed to be of pre-Cambrian age. Intersecting these rocks to the south east of Pomona is a huge intrusion of elaeolite syenite (foyaite), which is accompanied by satellitic dykes of tinguaite, camptonite and monchiquite; the syenite being admirably exposed in the so called Granitberg. Throughout the littoral the strike of the ancient crystalline and sedimentary formations is approximately north and south and to this circumstance without doubt the prevalent north and south trend of the principal surface features is due. Remnants of very much younger sedimentary rocks occur in different parts of the area. To the east and south-east of Bogenfels and at Buntfeldschuh they take the form of horizontal sandstones, marls, clays and conglomerates. To the east of Elisabeth Bay there is a large outlier of sandstone, capped by onyx limestone; and sandstones generally of a reddish colour also occur on the Stauch claims, to the south of Kolmanskuppe, and at the foot of the Nautilus Berg near Lüderitzort. The present distribution of these rocks clearly indicates that they must at one time have filled most of the depressions of the littoral, and there is direct evidence to show that the material, of which the diamondiferous deposits are composed, has been derived in considerable part from their disintegration—under the influence of desert weathering. The sandstones are of particular interest in this respect for they are seen in places to consist largely of grains of agate and chalcedony—conspicuous constituents of the diamond bearing gravel, and, according to Scheibe (172), they have actually been proved to contain diamonds. With regard to the age of the beds, which are fossiliferous, no definite conclusion has as yet been reached. Merensky (197), as a result of his determination of gasteropods found near Elisabeth Bay, has co related the sandstones there exposed with the Umtamvuna Series of Pondoland (Upper Cretaceous). Professor Bömh,[§] to whom fossils from the exposures to the east of Bogenfels were submitted, on the other hand, inclines to the view that these are of Middle Tertiary age. As yet the exact relationship in which the Elisabeth Bay sandstones stand to those at Bogenfels has not been determined, and it is quite possible that both Cretaceous and Tertiary rocks are represented. Still younger marine deposits in the form of shingle terraces and raised beaches are developed all along the coast, and attest to recent movements of uplift.

(*To be continued.*)

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[*] Abstract from "The Diamond Fields of South Africa," by Dr. P. A. Wagner.

[†] This coarse sand, for lack of a more suitable term, is generally referred to as gravel.

[‡] An admirable map of this section of the littoral has been published by Reuning (250).

[§] *cf.* Range (221).

Natal Coal Returns.

A return is published in the *Natal Provincial Gazette* showing the output of the various Natal collieries for the month of July. The following is a complete list of the mines in question with their output in tons: Dundee Coal Co., 36,216; Natal Navigation, 29.764; Hlobane, 27,596; **Durban Navigation, 22,530; Elandslaagte, 19,052;** Utrecht, 17,976; Glencoe (Natal), 15,703; Natal Cambrian, 11,893; South African, 10,860; **Hatting Spruit, 10,771; Natal Steam, 6,728; Newcastle, 6,696;** Ramsay, 5.556; Ballengeich, 4,308; Fairleigh, 4,090; Wallsend (Natal), 3,085; Dewar's Anthracite, 1,100; South African (Vryheid) Coke, 481; Avon Collieries, 309; Natal Ammonium (developing); total, 234,714, total for the corresponding month of 1913, 250,310.

THE COST OF THE WAR: AN ATTEMPT AT ESTIMATION.

Enormous Loss to Belligerents—Great Industrial Wastage—Some Thought-Compelling Figures.

What loss may a European war involve the belligerent countries and the world? To attempt anything like an exact answer would be absurd, but when the Great Powers come to blows they allow no financial difficulties to interfere with their expenditure, and by hook or crook the most penurious of them will find money for its troops. The South African war cost Great Britain far above £200,000,000, and if a European war cost only two and a half times as much we get the total of £500,000,000, which is probably a very conservative estimate. Indeed, at a conservative estimate the cost would scarcely be less than £1,000,000,000, all of which would have to be drawn from the resources of industry, from the world's working capital. The money publicly raised in London every twelve months is about £200,000,000, so that a war on the thousand million scale would be draining the capital market directly of five years' supplies of the greatest capital centre in the world. But when the direct cost of the war has been calculated, and the bill to be paid to the last penny, we shall only begin to realise the wastage, only touch the edge of the actual loss. In every part of the world to-day capital is in a difficult, strained position. The supply is not adequate, and the sums already expended in industry are jeopardised because further sums are not at hand to keep the works moving. In Canada, in the Argentine, in Brazil, the situation is the same; more capital wanted to prevent the old capital from being wasted. The world is turning a nasty corner, and under the happiest conditions the passage would not be easy. Hence the financial centres are specially vulnerable, and the crisis has already hit them very hard. Here is a list of a few falls that took place on the London Stock Exchange between Friday and Tuesday in mail week, the period that lay between the ultimatum and the declaration:—

	July 23.	July 28.	Fall.
Consols	75¼	71¾	3¾
German 3 per cent.	75	72	3
Russian 4 per cent.	84½	80	4½
French Rentes	81	77½	3½
Austrian Inter.	95½	87½	8
Servian 4 per cent.	72½	67	6½
Peruvian Corp. Pref.	37½	30	7½
Canadian Pacific	188¾	176	12¾
Union Pacific	161	152½	8½
Rio Tintos	67	56¾	10¼

To gain some idea of the depreciation involved in these figures, take two securities only, Canadian Pacific Common stock and Rio Tinto Ordinary shares. There is roughly £55,000,000 of Canadian Pacific, and there are 375,000 Tinto shares. Between Friday and Tuesday they fell in value to this extent:—

	Depreciation.
Canadian Pacific	£6,600,000
Rio Tintos	£3,750,000

In other words the threat of war, not the outbreak, produced, within four days, in two securities alone, a loss of over ten million sterling. Carry the calculation through the Stock Exchange list and we begin to see in dim outline something of the waste of war.

A PAPER LOSS.

It may be that the above figures represent a paper loss, and that the value of the Canadian Pacific Railroad and the Rio Tinto mines remained on Tuesday exactly what it was on Friday. In a sense no doubt the loss in a paper loss, but it is none the less real for that. It represents roughly the market's attempt to discount the effect of war, and the first results of war finances on credit. It may seem irrelevant to talk about a Canadian railroad and a Spanish mine whose fortunes are apparently as removed from Eastern Europe as they well could be; but they are in fact intimately connected, and, paradox as it may sound, there are few countries in the world which stand to lose more by the war than Canada. Her half-finished industrial schemes, her railroads, newly built and heavily bonded, are still dependent for their life on European credit, and once the support of that credit is withdrawn no man can foresee the country's future. The same is true of Argentine, of Brazil, and in a minor degree of Australasia and South Africa. Wherever development work is in progress, European capital is essential, and if we spend a thousand millions on war, bring our factories to a stand-still, destroy our commerce, and slaughter our population, how shall we spare capital for the growing nations of the world? Of the financial centres of the world the heaviest sufferer seems at present to be Paris, which is paying the penalty for her reckless finance of the past two years. The practical closing of the Paris markets and the scramble for cash indicated by the phenomenal state of the Paris cheque are a severe blow to the prestige of the lead of Continental finance. Paris—to whom at moments of financial crisis Europe turns instinctively for help—is a source of weakness instead of strength, and is shooting her losses on to the London Stock Exchange. She is overburdened with military armaments. A signal recovery will be needed if the Paris Bourse is to regain her former position. However events turn, the loss to Paris and to France will be great beyond calculation.

LOSS TO GERMANY.

Germany, whatever may be the result of the campaign, will be the heaviest loser. In the incredible event of her emerging victorious, and exacting enormous monetary indemnities from the Allies, she would still require to build up a trade absolutely shattered by the war; for almost every penny of her indemnities will be required to rehabilitate her army, her navy, and her merchant shipping. In the far more probable—nay, practically certain—event of Germany being forced to accept the terms dictated by the Allies, her ruin will be so great that these very Allies will be forced, for their own sakes, to come to her rescue to some extent. Her trades, shipping, food supply, manufactories and everything concerned with the life of a nation will have been brought to a dead standstill before she sues for peace, and to reanimate them will require the help of her victorious enemies, for Germany cannot possibly do it alone. To estimate the loss to her in figures is impossible, for no such gigantic proposition has ever been placed before the political economist before. One may safely say, however, that in indemnities alone the price exacted by Germany from France over forty years ago will probably be exceeded by fully ten times in her own case! In that event she will have to pay from her public revenue a sum of two billion pounds, spread over a period of years! The losses of the war will fall as heavily in proportion on Austria as Germany, and on Russia as on Great Britain. It will run in each case to hundreds of millions, while every other nation in the world—with the possible exception of America—will feel the dreadful and almost paralysing burden. What then would be the full loss of a great European war? Thirty years setback in the world's material progress! Whatever the result, whatever the conquests, whatever the exchange of territory, every trading country and every man who lives by business is a certain loser. Whatever money may be invested danger assails it, though it may be thousands of miles from the seat of any European war. That is the grim fact the whole world is facing to-day, as we know the solemn truth that we live on credit and that credit lives by peace. Hitherto that has been an academic platitude. To-day it is a terrifying fact.

Miners' Phthisis.

In the course of an informal discussion upon rock drills (says the *Colliery Engineer*), H. M. Chance spoke of the troubles from fine dust entailed by the newer forms of such machines, and referred to past investigations on the effect of coal dust upon the health of miners, published by the Second Pennsylvania Geological Survey about 1882. He stated that the fine dust resulting from mining operations, and from industrial pursuits, seemed to affect the lungs and air passages in three ways: (1) When the rock is chiefly of quartz, or silicious material, the dust consists of angular particles or splinters with sharp cutting edges, which particles work through the mucous membrane into the lung tissue, causing serious lesions or death. Such conditions exist in South African gold mines, and in some of the mines in the western United States, wherever the mineralized rock consists largely of quartz. (2) Other entirely distinct pulmonary and bronchial diseases may be caused by dust or soot which carries irritating or poisonous acids or oils condensed upon the surface of the particles. These substances, while not necessarily fatal in their effects, are likely to render the individual more liable to contract tuberculosis, or other disease, by weakening the tone of the tissues. (3) Another effect caused by the inhalation of large quantities of dust is the overloading of the lungs with foreign material, which, while it may be entirely free from any irritating quality, clogs and finally fills the air cells until they can no longer perform their functions. Coal dust in itself is not particularly dangerous to ordinarily robust men.

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LATEST MINING NEWS.

The Output in Detail—Shamva's Excellent Showing—All Gold Fields Subsidiaries Do Well—Outlook Favourable.

THE Rhodesian gold output has been declared by the Chamber of Mines at 76,687 ozs., value £320,000, a record by £11,000 and exceeding the output for July, 1913, by £71,000. The Shamva, which has at length got a full month's run, crushed no less than 50,000 tons for £38,000 of gold. With the exception of the Cam and Motor, all of the new producers have had an excellent month, the Goldfields subsidiaries having done remarkably well. Future prospects are bright. The Golden Kopje is expected to declare a first output for August, though the mill is not being fully run until the new generator has been installed, and the Falcon, on which remarkably good results have been secured, will also probably enter the producing list. It is quite remarkable that the rise in the output during the year is approximately £70,000 monthly, and this is really only the beginning of progress. No doubt some of the small ventures will constantly be dropping out, but of the great mines of the country, the only one which gives cause for anxiety is the Giant, the output from which dropped last month to 843 ozs., but even here there is reason to hope that the mine's day has not entirely passed.

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The owners of the Saxon mine have about 200 tons of rich stuff at grass, and intend to have a trial crushing as soon as water has been found. The main winze has been sunk to a total depth of 85 feet, and is still in values. A shoot of 60 feet of rich ore has been opened up in the drives, and values are said to be continuing.

The Lomah (Rhodesia) report that values continue good, and the general position is satisfactory. They contemplate the early erection of reduction plant.

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At the Mulloch the Tremain mill started crushing on Tuesday last, and good results have been secured. Reduction work is at present being confined to the development dump, of which about three tons remain to be crushed. By the time this work has been completed the owners should have an accurate idea of the average value of the blocks of ore ready for stoping in the mine.

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Resume of Rhodesian mineral output for July:—

	Ozs.	
Bulawayo	17,687·65	£73,657
Gwelo	20,393·26	85,414
Hartley	15,631·83	65,344
Salisbury	11,056·48	46,347
Mazoe	4,205·31	17,560
Lomagundi ...	2,767·51	11,608
Umtali	4,002·13	16,822
Victoria	943·30	3,915
Total	76,687·48	£320,670

Rhodesia Chamber of Mines.

The report of the Executive Committee of the Rhodesia Chamber of Mines for the month of June, 1914, states, *inter alia* The following is a summary of the returns of native labourers employed on Southern Rhodesian mines during the months of April and May, 1914:—

	April.	*May.*
Local	12,545	13,993
Portuguese Territory	6,912	6,956
North Western Rhodesia	4,335	4,312
North Eastern Rhodesia	5,389	5,557
Nyasaland	7,157	7,266
Other Sources	891	937
	37,229	39,021

The number employed in May, 1914, shows an increase of 5,336 as compared with the same month of 1913. Increases are from all sources. A special meeting of the Executive Committee was held on the 30th June to consider the proposed amendment of the Union Customs Tariff. At this meeting the Controller of Customs was present, and the Committee had the advantage of hearing his views thereon. At the usual monthly meeting held on the 17th inst. the following resolution was passed: "That a principle of some taxation of South African products imported into this Territory should be arrived at and that a revision of the Union Tariff is necessary. That unless the Union Government is prepared to accept such revised tariff, then in the opinion of this Chamber it would be in the interests of the country to retire from the Customs Union." Messrs. P. B. S. Wrey and George Stewart were appointed delegates to attend the conference, under the presidency of His Honour the Administrator, to be held in Salisbury on the 27th and 28th inst. The two delegates, Messrs. Wrey and Stewart, attended the Conference of Chambers of Mines held in Bulawayo on the 20th of June. The Committee has further considered the proposed new regulation with regard to poisonous fumes from the cyanide process, and is still of opinion that the regulation is not necessary, and representations to this effect have been conveyed to the Secretary for Mines. Correspondence has taken place in reference to Government Notice No. 218 of 1912 with the Salisbury Chamber of Mines and the Rhodesian Small Workers' and Tributors' Association, who entirely agree with the Chamber that the operations of the new regulation would result in great inconvenience and loss to the industry, and that it would be unworkable in practice. It has been arranged to hold a joint meeting in Salisbury on the 27th inst., to decide what action should be taken, and thereafter to interview the Government in regard thereto. Meantime the Secretary for Mines has been asked if the Government could see their way to suspend the regulation in order to give time for the various bodies representing the industry to discuss the matter with the Government. Amongst other matters dealt with by the Committee during the period under review were: Native Reserves Commission; Railway Rates; Mines and Minerals Ordinance: Compensation to farmers for prospecting on cultivated lands.

Rhodesia Consolidated.

The report of Rhodesia Consolidated, Ltd., presented at the recent meeting, covers the year ended 31st March last, and shows a profit of £2,279 as compared with a loss of £10,098 for the eighteen months covered by the previous accounts. The issued capital remains unaltered at £597,337. The directors, acting under the advice of the company's engineers, have still further reduced the number of undeveloped claims, and the following figures show the number of claims in which the company was interested at the date of the present, as compared with that of the last, accounts: 31st March, 1913: Owned, 535; partly owned, 60. 31st March, 1914: Owned, 515; partly owned, 30. In view of the difficulty of raising capital for mining propositions, no development work has been undertaken during the period under review. 20,959 acres have been sold at an average price of 9s. 9d. per acre, the profits on these sales amounting to £1,917. The balance of land unsold on 31st March last was 466,910 acres, standing in the books at 5s. per acre. The directors have continued their efforts to effect reductions in the standing charges on the maintenance of the company and its assets. Excluding depreciation and income tax, these charges, for the period covered by the accounts, amounted to £1,305, as compared with (at the rate of) £8,954 at 30th September, 1912, and with £16,153 for the previous year. The directors' fees in the accounts now submitted amount to £969, and include gratuities given to directors who, to reduce expenses, retired from the Board.

RHODESIA'S MINERAL OUTPUT IN JULY.

Another Record Yield—Complete Details of Returns.

We have received for publication from the office of the Rhodesia Chamber of Mines (Incorporated) the following detailed statement of the mineral output for the month of July, 1914, with comparisons and values:—

MATABELELAND.

	No. of Stamps.	Tons Treated.	Yield. ozs.	Value. £
Bulawayo District—				
Abercorn (W. J. Lane)	5	150	37·22	154
Agincourt (H. L. Maidwell), June, clean up	—	-	43·44	182
Antelope G.M. (Rhod.), Ltd.	2BM2P1T	4,235	1,099·41	4,617
Do. (slimes)		3,811	1,229·27	5,163
Antenior (W. J. Lane)	5	400	67·35	281
Atlas (Est. R. Barkley, decd.)	10	826	153·95	641
Do. (sands)	--	490	21·38	89
Basch (Morrison & Granger)	5	250	70·16	291
Bassick (Bassick Mines Synd.)	5	48	78·18	324
Blanket (Forbes Rhod. Synd., Ltd.)	15	310	88·08	370
Blue (J. Eisenhammer)	2	60	20·68	87
Bobs (F. W. Spencer)	5 1C	425	46·63	193
Borrow (W. H. Robinson)	2	312	50·21	208
Bucks & Prestwood (J. Black)	5	519	237·95	986
Do. (sands)		360	52·45	217
Bulawayo Main (R. Aserman)	4	120	42·49	176
Bushtick Mines, Ltd.	20 8Ni-3T	6,228	268·79	1,120
Do. (sands)	--	3,334	521·07	2,175
Do. (slimes)	-	2,842	290·79	1,214
"C" (D. & C. Synd.)	10 1C	1,707	104·18	432
Do. (sands)		1,462	136·71	542
Do. (slimes)		245	56·33	234
Champion (R. Aserman), by products, June, 1913		85	66·33	272
Claremont (B. L. Whyte)	5.2Nissen	767	72·18	303
Colleen Bawn (Colleen Bawn Syndicate, Ltd.)	6 2P	893	126·95	526
Do. (sands)		420	110·10	456
Do. (slimes)	--	605	166·88	692
Cottage (E. R. Napper)	4	60	18·96	79
Criterion Gold Mines, Ltd.	10	1,602	317·44	1,316
Do. (sands)		1,176	67·33	279
Donova A. (W. K. Early)	3	22	14·49	60
Eagle A. (Macdonald & Co.)	10	1,106	352·37	1,471
Do. (sands)		297	47·71	198
Ellas (S. H. Burns), sands		1,000	2·28	9
Elumba A. (Cooper & Bosomworth)	5	600	141·38	586
Do. (sands)	-	300	59·60	247
Euphorbia (D. W. K. Syndicate)	1H	36	6·87	28
Farvic (H. S. Henderson)	5	775	626·23	2,617
Do. (sands)	-	490	71·35	296
Flora (E. E. Beecroft)	5	753	211·14	875
Flying Dutchman (P. G. Challen)	5	72	17·36	73
Fred (Transvaal & Rhod. Est., Ltd)	10 2P	1,700	880·97	3,700
Do. (sands)		1,700	326·36	1,371
Godwin (Barrett & Stacey)	5	134	168·05	697
Do. (sands)		220	63·53	263
Golden Butterfly (Wheeler, Davis and Rintoul)	5	526	138·17	573
Do. (concentrates)		4	14·57	60
I. Alone (H. G. M. Huntley)	3	40	11·15	46
Intabanenda (Est. B. Smallie, dcd.)	5	240	21·85	92
Do. (sands)		220	28·46	119
J. D. B. (J. A. Warwick), May			29·07	122
Do. (May), sands		280	17·01	71
Do. (June)	5	418	53·05	223
Do. (July), clean-up	—	—	9·71	40
Jumpers (J. P. McCay)	5	560	177·36	735
Do. (sands)	—	330	65·30	271
Kameel (Yellow Jacket Synd.)	5	693	129·56	537
Do. (sands)	—	1,200	70·21	291
L. (J. A. Warwick), April, sands	—		14·10	59
Lively A. (G. D. Wright), pannings		-	·84	3
Lone Hand (Armstrong, Furber & Alexander)	5	374	140·07	581
Do. (sands)		226	44·19	183
Lonely Reef G.M. Co., Ltd.	20	5,540	1,461·79	6,060
Do. (slimes)	—	5,540	2,624·16	10,878
Long John and Lady Lina (Susanna Mines, Ltd., & B. E. Co., Ltd.)	(13)	1,390	94·27	395
Do. (sands)	—	1,357	200·86	838
Main Road (Triggs & Huntley)	5	413	71·78	297
Marvell (Dumbleton, Peard & Owen), sealing plate	—	--	17·64	73
Matabele Queen's Co, Ltd.	10	1,830	285·90	1,185
Do. (sands)	—	1,830	280·32	1,162
Do. (slimes)	—	470	58·51	243
May (Cummings & Berry)	(3)	88	27·42	114
Mayfair (Hicks & Arbery)	—	375	160·50	674
Namaqua (T. W. Angus), clean up	—	-	7·91	33
New Eclipse (J. R. Stewart)	5	955	163·28	677
Do. (sands)	—	290	26·31	109
New Jess 1 (M. & G. Hogg)	2	20	83·84	347
Northern Star (Northern Star Syd.)	10	119	127·30	528
Old Nic (Chart. & Gen. E. & F Co., Ltd.)	15 4P	1,310	354·41	1,469
Do. (sands)		772	182·76	758
Ontario (Bowrnes & French)	(5)	100	27·26	114
Peach A. (Peach Syndicate)	5	171	298·95	1,231
Do. (sands)	—	215	35·51	147
Penzance (Penzance Tributing Sd.)	2	140	33·12	138
Do. (sands)	-	70	33·73	140
Princess (C. A. Abbott)	2	299	86·85	360
Rhodesian Queen (J. Gilpin)	6	100	41·92	176
Roin (Robinson & Berwits)	2	220	65·19	273
Rubicon (Anglo Rhodesian Develop. Co., Ltd.)	5	304	24·71	103
Sara (Cooper & Johanson)	—	140	50·13	210
Shot Gun (Cummings & Berry)	(3)	20	7·35	31
Star and Claydon (Romola Nigel G.M. Co., Ltd.)	—	311	52·46	217
Susanna Mines, Ltd.	13	297	41·52	174
Do. (sands)	--	297	39·00	162
Teutonic & North (Macdonald and Bonshor)	5	598	582·05	2,432
Do. (sands)	--	560	10·37	41
Tuff Nut (King's Synd.), slimes	-	140	24·47	105
Umvoti (Henderson & Toshack)	2	240	111·90	464
Winifred (Exchange Syndicate)	5	527	194·52	815
Do. (sands)	--	182	47·91	199
Zealandia (J. Nillin)	5	140	40·46	170
Bulawayo district total			17,647·65	73,658
Gwelo District—				
Alderman (Williams & Woodger)	3	180	134·79	559
Ardpatrick (B. Frau)	3	393	184·29	764
Bedad (A. & B. Syndicate)	5	300	20·47	85
Do. (sands)		435	43·5[illegible]	183
Bell Reef Dev. Co., Ltd.	2BM 1T	3,490	1,816·10	7,628
Blutcher R. T. C. (Robinson and Bennett)	Pn.	510	15·62	66
Blutcher, March, concentrates	-	10	64·15	268
Do., April		535	21·98	92
Do., May		690	24·20	102
Do., May, concentrates	—	343	54·56	228
Do., June		136	7·68	32
Bonsor (Cornish Syndicate)	20	3,000	161·62	670
Do. (sands)	—	1,530	14·68	61
Camelia B. (S. Levin)	5	694	255·43	1,059
Cinderella (P. Burt)	E	340	31·86	132
Cissy (G. Nicholson)	1H	90	46·42	195
Collingwood (Pini & Wearing)	5	500	135·78	563
Csardas (Wolfshall Syndicate)	10	437	567·16	2,351
Do. (sands)		300	79·35	329
Do. (slimes)	–	137	18·97	79
Fenella (J. Kinrade)	5	28	14·70	61
Gaika G.M. Co., Ltd.	5 1C	3,386	1,456·06	6,115
Do. (sands)	–	1,690	181·71	763
Do. (slimes)		2,278	120·36	506
Gartley (A. J. Grant), March, clean-up	—	–	23·69	99
Do. (sands), clean-up	–	—	9·11	38
Glen Rosa (D. H. Curry)	2	170	330·43	1,370
Do. (sands)	—	170	74·80	310
Globe & Phoenix G.M. Co., Ltd	40 10P	6,037	7,697·01	32,327
Do. (sands)	—	5,299	1,207·69	5,074
Do. (concentrates)		306	354·36	1,511
Do. (slimes)	—	2,549	392·10	1,647
Do. (by-products)		—	14·15	60
Gothic & Pagamesa (Mashonaland Agency, Ltd.)	15 2P	1,485	546·52	2,318
Do. (sands)	--	1,540	153·40	651
Invulnerable (W. H. Steele)	5	109	36·02	149
Kaka Main (I. Maleham)	5	447	130·38	540
Kings (P. S. Warden), slimes		440	72·85	302
Do., June, slimes	-	340	71·96	302
Maise Luck (J. Jones), June	6	80	39·77	167
Moonie River (Yellow Jacket Sd.), sands	—	50	3·41	14
Moss R.T.C. (W. M. James)	2	409	224·40	930
Do. (sands)	—	396	35·07	145
Multum (W. Cock)	2	119	9·00	37
New Dunraven G.M., Ltd.	5	450	94·68	392
Do. (sands)	—	400	16·83	70
Paradox (J. T. Woods), sands	--	450	22·12	92
Pompei (Bolt & Franks)	5	250	63·87	265
Pondo (F. C. Luxat)	1H	20	8·5[illegible]	35

	No. of Stamps.	Tons Treated.	Yield. ozs.	Value. £
Pretty Polly (Rhodesia G.M. Invest. Co., Ltd.)	5	370	49·42	205
Redhill (Redhill Dev. Synd., Ltd.)	1C	3,187	64·89	273
Do. (sands)	—	1,529	94·98	399
Shamrock (Champin & Masters)	10	1,000	156·00	651
Do. (sands)	—	200	12·46	52
Shannon (A. Malcolm)	5	249	25·10	105
Somerset (D. & J. Laing)	2	210	79·75	331
Do. (sands)	—	150	45·98	191
Spiral (C. C. Stack)	2	35	35·18	147
Tebekwe (A. N. Tyrrell)	15	729	141·68	587
Tebekwe 1 (A. N. Tyrrell)	(15)	1,119	275·88	1,144
Tebekwe (H. C. Baker)	5	581	33·34	138
Wait and See (Hughes, Sumner and Straub), June	2	45	17·42	73
Wanderer (Selukwe) G.M., Ltd.	4GR	11,532	1,660·59	6,884
Warner (Yellow Jack Synd.), sands		350	16·00	67
Welcome Back	2 1H	933	141·47	586
Do. (sands)	—	636	39·15	162
Yankee Doodle (Bruhns & Schwarz)	10	1,512	245·04	1,029
Do. (sands)	—	1,090	155·62	654
Gwelo district total			20 393·26	85,414

Matabeleland total ... 38,080·91 ozs.
Value ... £159,072

MASHONALAND.

HARTLEY DISTRICT—

	No. of Stamps.	Tons Treated.	Yield. ozs.	Value. £
Acorn Gold Mines, Ltd.	5	477	175·92	729
Do. (sands)		280	67·43	280
Agnes (P. S. Triggs)	5	550	146·01	605
Do. (sands)	—	350	12·60	52
Alabama (Alabama Syndicate)	3	98	27·46	114
Baltimore & Virginia (P. A. Enke)	1Pn	198	27·71	115
Blue Rock (Blue Rock Synd.), June sands	—	150	20·22	85
Brilliant (Mabel's Luck Synd.)	5 1P	1,031	512·70	2,125
Do. (sands)	—	500		
Do. (slimes)		567	81·83	339
Brompton (R. R. Aitken)	5	625	141·92	588
Do. (sands)	—	450	48·55	201
Cam and Motor G.M. Co., Ltd.	Roasting	12,234	3,742·36	15,868
Chadshunt	5	145	268·11	1,111
Do. (sands)	—	105	27·10	112
Cheshire Cat (Arnold & Windley)	5 1P	374	177·56	744
Concession & W. Ext. (C. E. Simpson)	5 1C 2P	2,681	520·79	2,159
Do. (sands)	—	1,694	154·45	640
Dalny (Macdonald & Sale)	5	900	71·80	298
Do. (sands)	—	500		
Do. (slimes)	—	390	121·42	503
Dalny 1W. & Whistlecock (Macdonald & Sale)	5	681	69·01	286
Do. (sands)	—	375	82·23	341
Dreadnought (W. E. Masters)	1C	369	160·89	676
Eiffel Blue (Willoughby's Cons. Co., Ltd.)	10	1,329	814·25	3,375
Do. (sands)	—	836	47·20	196
Eileen Alannah Mining Co., Ltd.	10	2,162	1,004·56	4,164
Ella (Luxat & Morrison), sands	—	160	43·70	184
Enney Ext. (Ellsmoor & Goodyer)	5	550	121·96	506
Do. (sands)		340	20·33	84
Giant Mines of Rhodesia, Ltd.	30 2T	4,200	843·55	3,578
Glasgow Mines, Ltd.	5	763	183·41	770
Do. (sands)		360	53·06	223
Do. (slags)		—	18·18	76
Glencairn No. 3 (Glenrosa Mines, Ltd.)	5	500	202·96	841
Golden Valley (J. Mack & Co.)	10	934	242·22	1,004
Do. (sands)		630	54·03	224
Guelph (J. & M. Davidson)	(2)	35	17·10	71
Hepworth No. 1 (L. Heilman)	2	203	49·51	205
Hilda (F. K. Keegan)	(2)	6	5·20	22
Inez (Harrill & Smith)	10	1,125	169·37	702
Do. (sands)		750	77·41	321
Jessie Palmer (Crown Syndicate)	2	110	34·48	143
Do. (sands)		100	17·06	71
Kanyemba (Kanyemba Synd.)	5	550	364·93	1,513
Do. (sands)		170	58·24	241
Lemberg No. 1 (A. D. Bentley)	2	200	50·65	210
Lily 1 (Erickson & Baines), clean up		—	9·11	38
Masterpiece No. 2 (Brunton and Talbot), by products			17·31	73
Midwinter (Midwinter Syndicate)	4	437	63·15	262
Do. (sands)		270	16·66	69
Do. (sands), June	4	418	65·79	276
Do. (slimes), June		260	17·40	73
Moliere (H. Moser)	5	720	97·96	406
Madale (B. C. Munro)	2	183	150·24	623
Norman (Fraser & McBean)	2	290	114·57	475
Oleander (O. T. de Villiers)	3	350	88·79	368
Ocean 17 (St. Kilda Syndicate)	3	72	22·27	94
[illegible] (A. Rolfe)	10	1,471	417·75	1,732
Do. (sands)		1,125	265·21	1,101
Pickstone Gold Mines, Ltd.	10 1C	[illegible]	338·18	[illegible]
Do. (sands)		1,611		
Do. (slimes)		1,372	478·64	1,992
Pomposo (J. Knott)	5	160	99·77	414
Rhino (H. W. Joslin)	Pannings	—	1·73	7
Rosaline (J. F. Meade)	5	260	39·07	163
St. George's No. 1 (Hussey and Fraser)	Pannings	—	21·02	87
Seigneury (Arnold & Windley)	5	475	177·37	737
Do. (sands)	—	300	38·49	160
Shepherds (Phoenician (Rhod.) Co., Ltd.)	5 1T	1,025	373·27	1,547
Do. (sands)		1,025	226·10	937
Sid (Sebakwe and District Mines, Ltd.), sands, clean up	—	330	33·99	143
Thistle Etna G.M., Ltd.	1C	2,585	738·96	3,103
Do. (sands)	—	2,105	102·56	431
Do. (slimes)	—	202	38·61	162
Trinity (G. C. Hooper)	3	71	38·41	161
Do. (sands)		106	4·21	18
Try Me (R. R. Aitken), by products		—	2·90	12
Village Main (Bruce & Buchanan)	5	170	38·09	158
Warthog (Durbar Syndicate)	5	18	4·28	18
Do. (sands)		40	3·24	14
Washington and Golden West (I. J. Minnaar)	5	550	179·08	742
Do. (sands)	—	400	32·08	133
Do. (slimes)	—	300	23·78	99
Hartley district total			15,631·83	65,344

LOMAGUNDI DISTRICT.—

	No. of Stamps.	Tons Treated.	Yield. ozs.	Value. £
Alluvial (G. Blacklaws)			43·79	181
Do. (Purcell & Dean)	—	—	27·11	113
Do. (A. Smith), June		—	7·35	31
Do. (A. Smith), July	—	—	4·84	20
Eldorado Banket G.M. Co., Ltd.	15 1C 4P	4,979	1,547·87	6,501
Do. (sands)	—	5,078	698·26	2,933
Do. reserve	—	—	120·00	509
Gondia (J. A. Morris), June	5	165	14·94	63
Gondia (J. A. Morris), July	—	170	16·53	68
May (May Syndicate, Ltd.)	5	368	115·75	480
Do. (sands)	—	400	57·49	238
Mediteraneo (Perhat & Baburizza)	2	139	21·88	91
Do. (sands)	—	250	15·57	65
Medway (F. L. Standen)	5	51	13·94	58
New Bonanza (R. W. Stone)	3	95	62·20	258
Lomagundi district total			2,767·52	11,609

MAZOE DISTRICT.—

	No. of Stamps.	Tons Treated.	Yield. ozs.	Value. £
Alligator (R. Athey)	6	30	14·26	59
Botha H. (Cunningham & Allison)	5	2,060	81·98	340
Do. (sands)	—	930	117·22	486
Day Dawn (Day Dawn Tribute)	—	231	203·16	850
Epha (Francis & Currele), June and July	2	170	60·60	253
Glandore (Harries & Cooke)	2	189	40·10	166
Do. (sands)	—	400	36·95	155
Do. (June), sands	—	250	25·50	107
Honest (G. W. Wood)	—	10	4·28	18
Jumbo G.M. Co., Ltd.	30	3,300	504·83	2,146
Do. (sands)	—	2,030	265·35	1,128
Do. (slimes)	—	1,270	141·66	602
Kimberley (Mash.) G.M. Co., Ltd.	8 2T	4,850	920·85	3,817
Do. (sands)		2,250	378·28	1,568
Do. (slimes)		2,600	272·67	1,130
Low and Chief (Brice & Quick)	Pannings		4·40	18
Micky (Micky Syndicate)	2	239	326·46	1,366
Mitre (Bishop's Syndicate)	1D	11	18·34	76
Do. (sands)		20	9·40	40
Pompey (A. S. Warwick)	5	881	28·41	118
Puff Adder (Puff Adder Syndicate)	2	175	50·57	209
Do. (sands)		468	53·35	221
Ravine (H. O. Coker)	2	230	83·20	345
Tat (Occola G.M. Co., Ltd.)	5	500	297·75	1,239
Do. (sands)	—	250	14·46	60
Venus (Giles & Southey)	2	334	213·15	885
Xmas (D. Pearce)		220	38·12	158
Mazoe district total			4,205·31	17,560

SALISBURY DISTRICT.—

	No. of Stamps.	Tons Treated.	Yield. ozs.	Value. £
Alpes (P. Zaffere)	5	200	241·11	999
Arcturus (L. Chiappini), sands		700	88·95	374
Ceylon (Monarch (Tati) G.M. Syd., Ltd.)	5 1P	809	526·67	2,192
Do. (sands)	—	809	165·50	686
Cross Your Luck (S.T.L. Synd.)	Clean up		4·06	17
Euchered (Harrison & Drabble)	2	479	110·23	457
Found A. (O. W. Kelly)	2	136	64·88	269
Inyague 3 (P. L. Peters)	2	150	70·09	291
Do. (sands)	—	450	47·39	196
Lenard (G. E. Daniel)	1H	35	24·94	105
Louise Grand (H. S. Plunt)	1H	561	57·81	240
Mont d'Or (Claxton & Bassell)	2	91	115·22	[illegible]
Do. (A. Cohen), sands		350	28·27	117

	No. of Stamps	Tons Treated.	Yield. ozs.	Value. £
Old Lonely (Shamva [illegible] G.M. Co., Ltd.)	5	510	[illegible]	[illegible]
Olympus (D. Perdis)	[illegible]	[illegible]	73·79	[illegible]
Shamva Mines, Ltd.	[illegible]	[illegible]	[illegible]	[illegible]
Do. (sands)		[illegible]	1.774·60	7,453
Do. (slimes)		33.923	3,660·62	15,375
Zidonian (J. Wilson)	5	40	13·44	56
Salisbury district total			11,056·48	46,347
UMTALI DISTRICT.—				
Arthur (M. L. Hole)	5	[illegible]	32·41	135
Cairndhu (E. K. Evans), sands		210	9·82	41
Champion (J. Buchanan)	5	834	136·28	565
Do. (sands)		486		
Do. (slimes)		348	79·21	[illegible]
Fairview 3 W. (P. M. Brankea)	5	27	26·69	112
Golden Adelaide (F. E. Markham), June	5	[illegible]	6·69	28
Inca (F. Young)	[illegible]	220	50·46	209
Kent (E. Evans)	10	850	[illegible]	1,258
Do. (sands)		690	55·62	230
King's Daughter (D.F. [illegible] Waterfall Synd.), sands		[illegible]	[illegible]	[illegible]
Liverpool (R. G. Snodgrass)	5	600	97·58	405
Do. (sands)		220	28·89	120
Montezuma No. 2 (Montezuma G.M. Co., Ltd.)	5	[illegible]	167·75	705
Pilgrim 2 E. (O. R. Caswell)	5	538	123·21	511
Quagga (Thompson, Murdock and Kapnek)	5	570	76·03	315
Do. (sands)		700	32·57	135
Queen (G. T. Hopkins)	5	82	11·72	49
Rezende Mines, Ltd.	115	19,900	1,631·16	6.921
Do. (sands)		2.832	282·88	1,200
Do. (slimes)		[illegible]	75·72	321
Do. (concentrates)		161	507·08	2.127
South Perthshire (Umtali Waterfall Syndicate)		501	91·52	379
Do. (sands)		140		
Do. (slimes)		105	20·21	84
Two Sisters (Simmonds & Moredew)	2	23	7·17	30
Do. (June)	2	35	14·64	61
Union (Umtali Waterfall Synd.), sands		31		
Do. (slimes)		21	41·84	173
Una (G. W. Rendall), June	5	200	13·16	55
Umtali district total			4.002·13	16.822
VICTORIA DISTRICT.—				
Empress A. (S.A. Prospecting and Concession Syndicate, Ltd.)	5	876	312·93	1 297
Do. (sands)		513		
Do. (slimes)		350	169·33	702
Panama (J. F. Kestell)			[illegible]	15
Texas (G. Scott)	[illegible]	1.409	308·31	[illegible]
Do. (sands)		750	149·07	[illegible]
Victoria district total			[illegible]	[illegible]

Mashonaland total	[illegible] ozs.
Value	£161,593
Total gold production	76.687·48 ozs.
Value	£320 670

GOLD OUTPUT COMPARISONS.

	Ozs.	*Value.*
Matabeleland	[illegible]	£159,072
Mashonaland	[illegible]	161,593
Total	76.687·48	£320.670

OTHER MINERALS.

		Value.
Silver, ozs.	[illegible]	£1,049
Lead, tons	[illegible]	162
Chrome iron, tons	[illegible]	5.750
Coal, tons (sales)	32.410·00	10.429
Arsenic, tons	·75	160
Diamonds, carats	159·75	590
Total value July output		[illegible]

MINING MEN AND MATTERS.

The next monthly meeting of members of the Geological Society of South Africa will be held in the Council Chamber, Chamber of Mines, Johannesburg, on Monday evening, 7th September, 1914, at 8.15 p.m. The following paper will be read:—"The Geology of the Chromite Deposits of Selukwe, Rhodesia," by A. E. V. Zealley, A.R.C.S., F.G.S.

* * * *

The Geldenhuis Deep has set a notable example in practical patriotism. At a meeting of the Recreation Club of the mine a few days ago, £200 was voted for equal division between the Prince of Wales's and Governor-General's Funds. It was then proposed that there should be a monthly subscription to the relief funds, and it was unanimously agreed that a deduction should be made from their wages by the mine office, and the funds so collected to be put into the hands of a committee for distribution among the Prince of Wales's, Governor-General's, French and Belgian Relief Funds, as the committee thought fit, with a proviso that a certain amount should be retained to deal with any urgent cases of distress which might arise among their fellow employees' dependents who may be hard hit as a result of the war. It is anticipated that this monthly subscription will amount to some £200 to £250, and the bulk of the men have authorised that this deduction should continue during the war period.

Lonely Reef G.M. Co.

The following are the results of the working of the Lonely Mine (Rhodesia) for the month of July:—Mill ran 29·19 days, crushed 5,540 tons; yield of fine gold, 1,461·792 ozs., value £6,145 2s. 4d.; slimes treated, 5,540 tons; yield of fine gold, 2,624·164 ozs., value £11,032 17s. 10d.; total recovery of fine gold, 4,085·956 ozs.; total value, £17,178 0s. 2d.; estimated profit, £8,928.

OIL AND THE NAVY.

As a result of extended and exhaustive trials, aimed at a maximum of efficiency under all conditions, the Government contract for the supply of ALL Lubricating Oils for the entire Fleet of the United States Navy has been awarded to THE TEXAS COMPANY, who have also secured for the fourth year in succession, the Navy Fuel Oil Contract.

These results were achieved in the teeth of the keenest competition in the World, and therefore bear eloquent testimony to the quality of TEXACO PRODUCTS.

The Texas Company (South Africa), Limited.

Telephone No. 3777, Johannesburg. P.O. Box 4907, Johannesburg.

Engineering Notes and News.

THE ENGINEER AND THE WAR.

Many and Great Engineering Problems to be Solved by the Present Conflict.

From the purely engineering point of view the present war is full of interest and instruction. So far our great ships of war have had no chance of showing what value is to be placed on new designs, but now that war is declared we shall learn if the lessons of the proving ground and the theories of the study are well founded. We shall know at last if the gun is really better than the armour; we shall learn if the 13½ inch gun is indeed superior to the 12 inch; we shall learn if the 4 inch quickfirer is efficient to ward off the attacks of destroyers. The problem of the submarine will be solved. Whether she is really as dangerous as the subtlety and secrecy of her attack have led us to suppose will be found out. We shall discover, too, if the torpedo itself is as formidable as it seems, and whether the immense improvements in it, which it owes to the engineer, have really made it the most fearful and deadly of naval arms. It is possible, too, that the greatest of all naval problems may be set at rest. Perchance some pre-Dreadnought ships may find themselves in conflict with the latest warships of the world, and we shall discover if the theory of the all big gun ship is well founded. Amongst other works of the engineer that will be put to the test of war between first-rate Powers the turbine must be mentioned. Whether it will endure the rough handling as well as the old reciprocating engines, whether it will be as faithful and dependable in its duty, is a question the answer to which all Admiralties and all engineers await with anxiety. Whilst the test of naval material of war is still in doubt, land material is already undergoing probation. Here the engineer has a host of new things to watch with interest. Our war in South Africa taught us many things about field artillery, and those lessons have been embodied in our 18 lb. field piece, which we believe is better than any in the world, though the new French field gun, a mysterious weapon about which little is known, may be superior to it. It is believed that the Germans, just as they have remained true to a smaller calibre naval gun, have also adhered to a smaller field gun; it is reported to throw a 15-pound shell. Whether it makes up in muzzle velocity for what it lacks in weight remains to be seen. But it is not only in the guns themselves, but in their carriages, that much that is new has to run the gauntlet of war. The old form of carriage that recoiled with the gun is now a thing of the past. The modern field gun-carriage is an elaborate structure with recoil cylinders and running-out springs. The gun runs back with but little movement of the carriage and the rapidity of fire is greatly increased. No one yet knows what effect such a highly developed weapon may have upon the issue of a battle. Again, mechanical transport is almost a new thing which has hardly been tested on the actual theatre of a war on a large scale. Many excellencies must be developed, many faults found. Those who are responsible for its design, no less than the engineers all over Europe, who have carried out the desiderata of their war offices, can hope for nothing better than that it should be found wanting under the crucial test. Coming to still greater novelties, we have to learn how the aeroplane and seaplane comport themselves, whilst the value of the airship must be decided once and for all.

Iron and Steel Prices.

The outbreak of war on the Continent had a hardening effect upon certain sections of the iron and steel industry in England, and particularly on the prices of steel plates and angles, the value of which rose about 10s. per ton. The explanation is, of course, to be found in the fact that the severe competition which has recently been experienced from German sources for this class of business has entirely disappeared for the time being, and English manufacturers are, therefore, in a position to restore quotations to a remunerative level. This they have lost no time in doing. Shipbuilders and others are inclined to find fault with the iron masters' action, but it is difficult to see how they can be blamed provided that they do not take undue advantage of the situation in which they find themselves.

INVESTORS' DIARY.

FORTHCOMING COMPANY MEETINGS.

Sept. 9. New Boksburg.
Sept. 11. Swaziland Tin.
Sept. 18.—Transvaal G.M. Estates (annual).
Sept 25.— Sub Nigel; Simmer and Jack Proprietary (annual).
Sept 29. National Bank (Pretoria).
Oct. 28. Rooiberg Minerals.

SKEFKO. S.K.F.

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'Phone 835. :: :: P.O. Box 654.

CAPETOWN : 53, LONG STREET.
DURBAN : 352, SMITH STREET.
HEAD OFFICE : LUTON, ENGLAND.

A Rand Mining Cause Celebre.

The hearing of an important "undermining" case before Mr. Justice Bristowe occupied most of the attention this week of the Rand High Court. The point at issue is: Whose is the liability for underpacking the railway line on the Simmer and Jack property—the Government or the Simmer and Jack G.M. Co.? Mr. R. N. Kotze, the Government Mining Engineer, a witness for the S.A.R., said it was his duty to see that adequate measures were taken for the protection of the railway. Under the Mining Regulations dealing with the subject of support, he had instructed the defendants to "underpack" with loose stones or by sand-filling, at their option. They had elected to do sand-filling, and they proceeded to carry out his instructions without protest of any kind except on the question of liability. The work he required of them was absolutely necessary. The authorities upon which Mr. Kotze relied required not only vertical but also lateral support. Upon that all were agreed; they differed, however, considerably as to the extent of lateral support; there being great variations of opinion according as the strata were horizontal or inclined. His instructions were based upon their minimum requirements. His evidence continued on highly-technical lines, dealing with the probability of underground falls at depths within 700 feet of the surface.

In a disquisition on the prospects for the Union, emanating from Pretoria, it is pointed out the gold mining will not be slackened, and agriculture is being given a powerful stimulus. It is reckoned that recent increases in the number of men employed by gold mines and collieries very nearly counterbalances the number affected by the closing down of the diamond mines. The calls for volunteers for irregular corps will still further ameliorate unemployment. Moreover, it is firmly believed that the Union will come out of the trial with stronger credit and a sounder commercial and industrial system.

MINING INSTITUTE.
Teaching Centres:—{ JOHANNESBURG and SCHOOL OF MINES, KIMBERLEY.

Prof. YATES prepares candidates for the following Government Certificates:—
MINE MANAGER'S. MECHANICAL ENGINEER'S.
MINE OVERSEER'S. ELECTRICAL ENGINEER'S.
MINE SURVEYOR'S,
by Class, Private Tuition, and Correspondence.

SOME 1914 RESULTS:—
MANAGERS - - - January and May - ALL Passed.
ELEC. ENGINEERS - February - - - - 66% ,,
MECH. ENGINEERS - June (Kimberley Centre) - - ALL ,,
MINE OVERSEERS - - - - - Practically ALL ,,
NEARLY 200 SUCCESSES. St. James' Mansions, Eloff Street.

THE TRANSFERENCE OF GERMAN AFRICAN TRADE TO GREAT BRITAIN.

Appeal by the British Trade Commissioner—Manufacturers' Efforts—How Consumers Can Help.

We have been asked to publish the following copy of a letter, dated August 22nd, from His Majesty's Trade Commissioner in South Africa (Sir Sothern Holland) to the Secretary of the Associated Chambers of Commerce of South Africa, which is being further circulated to all affiliated Chambers throughout the country:—

"Sir, It will, no doubt, be evident to the merchants and importers of South Africa that British manufacturers, encouraged by His Majesty's Board of Trade, are making concerted and unprecedented efforts to capture in this market the trade which hitherto has gone to Germany and Austria. In drawing your attention to these efforts, I would point out that they involve not only a determination to secure that trade by means of improved organisation, but by what is of even greater immediate importance, the manufacture of goods practically identical with those to which this market has become accustomed. Certain objections have, in the past, been urged against dealing with British firms interested in lines which our foreign competitors have exploited successfully, and they may be summarised by repeating the thoughtless assumption often advanced that the British manufacturer could not, or would not, offer the exact thing that was required by this market. The statement will not be possible in the future, except, perhaps, in isolated instances. No effort on the part of manufacturers can be successful, however well directed it may be, without co-operation of the merchant and the consumer. The merchant must, of course, be regarded as the most powerful force available in educating the consumer as to the merits of an article, and in creating a demand. I venture to think that I am not misrepresenting the attitude sometimes adopted towards past efforts of British makers to meet foreign competition in South Africa, when I express the opinion that sufficient allowance has not been made, nor has encouragement been offered, to the extent they merited; but it is impossible, on the other hand, to overstate the value of the practical assistance that has, in this connection, been given ungrudgingly to British trade by certain South African firms. I would point out, further, that although trade must, of necessity, be mainly a matter of pounds, shillings and pence, other considerations of undoubted importance ought to have weight, even though they may involve a modification of the necessity referred to. Those considerations may be recognised by reason of their intimate association with the benefits that follow "Trade within the Empire," as well as with the far-reaching consequences (now so much in evidence) of encouraging foreign competition against British industry. Official instructions received make it necessary at this critical time in the nation's history, for me to ask you to be good enough to circulate this letter amongst the Associated Chambers, requesting each Chamber kindly to submit an official resolution as to the extent to which its members will be prepared to assist in the promotion of British trade along the following lines: (1) By the purchase of British-made goods in preference to those of foreign manufacture, even where some slight sacrifice may be necessary, for which, however, the future will compensate; (2) by strenuous endeavours to create a taste for British-made goods amongst customers who, in the past, have had a preference for foreign manufactures; (3) by the use, to the greatest possible extent, of the machinery of the Board of Trade for the purpose of promoting British trade interests in the South African market. I await with confidence a frank statement from each Chamber, whose views are requested solely in order that His Majesty's Board of Trade may be made aware of the exact extent to which their efforts will be supported in South Africa by responsible merchants."

PAST GERMAN IMPORTS.

We reproduce the following extract from an article which recently appeared on the same subject: We imported from Germany last year electrical machinery to the value of a quarter of a million. From Great Britain we imported electrical machinery to the value of £142,000, and the only other important competitor was the United States, from whom we bought about £50,000 worth. The whole of the orders which have thus far gone to Germany might easily be filled in the United Kingdom, and we need not doubt that the British manufacturers will make special efforts to ensure that such orders are well "filled." Cyanide of sodium is a mining requirement, which has in the past been obtained chiefly from Germany, but here again, Great Britain has been a competitor, unless indeed the British exports of this commodity are merely re-exports. In this great crisis it seems to us to be the clear duty of every public body, every merchant, and every private citizen, to do his utmost to assist the British manufacturer by buying British goods. It is a comparatively trifling means of indicating some degree of patriotism, but when it is remembered that if such a policy were adopted throughout the British Empire, and every order hitherto placed with Germany were placed in England, it would represent in the gross order to the total value of about twelve millions sterling per annum.

HELPING OUR ENEMIES TO FIGHT US.

The following extract from a letter addressed to the *Cape Times* by a correspondent signing himself "H. H. J." is also worthy of reproduction. If we take the European population of the Union as 1,200,000, and deduct those under maturity, we find that the number is 685,000 adult men and women. On the basis of trade figures as given above, we find that the consumer spent on German goods an amount equal to £5 per head of adult population. Again, there are 435,000 married people in the Union, which means that the breadwinner's average works out at over £10 plus £5 per head for children who have [illegible] 20 years. This amount has enriched our enemies and provided them with the sinews of war. I am free to admit on the general principle it may not be desired to lock and bar our door against all goods foreign, but it must appeal to all Britishers that the majority of goods imported from Germany last year could have been produced and bought from Great Britain and her Colonies. Therefore the right policy is, and must be, as far as possible, "Trade within the Empire." An old school maxim reads: "Much evil is wrought through want of thought as well as want of heart." The heart of South Africa is sound towards the Empire; what is wanted is to turn our thoughts in the direction of how each one of us can best help. The remedy is in our own hands. Let each and all of us determine that when we buy any goods to ask the seller if the article is British or Colonial made, if it is, purchase; if not, refuse to purchase. This will have the effect of throwing unsaleable stock on the merchant who imports German and Austrian goods. The following reveals the attitude of the German people, and like the above programme, will, if carried out, reduce foreign imports to their lowest minimum.

THE GERMAN'S TEN COMMANDMENTS.

Hundreds of thousands of copies of a pamphlet called "The Ten Commandments" are being sown broadcast throughout Germany. They are as follows:—

1. Even when you have only one pfennig to spend, remember the interests of your fellow citizens and of your Fatherland.
2. Remember that each time you buy an article made abroad you are enriching your enemies and robbing your own Fatherland.
3. Your personal needs must be satisfied to the profit of German working men and German merchants.
4. Don't profane your German country, your German home, your German workshop by allowing foreign-made furniture, tools or machinery to find a place therein.
5. Don't allow foreign dishes or foreign meat on your table, for by so doing you harm not only your own home industries but also your health, as all food which the German Sanitary Commission has not stamped is poison.
6. Write on German paper, with German pens and German ink.
7. Buy only German clothes.
8. Only German flour, German fruit, German beer, and water from German springs can give you real German strength.
9. Drink only coffee from German colonies.
10. Let nobody lead you astray from this path, and be assured that your Fatherland's future depends on your strict observance of these commandments.

Now is an opportune time to draw the attention of the public to support the industries and products of our own people, and put an end to the foolish policy of helping our enemies to fight us.

TIT FOR TAT.

Now that Germany is at war with the Empire, the Empire need have no scruple whatever in applying precisely the same doctrines to German goods, wherever found, and ensuring that orders shall be placed in Britain wherever hitherto they have gone to "the Fatherland." The total volume of trade which can thus be diverted, much of it permanently, is not far short of twenty millions sterling, and the subjoined table shows the annual value of goods hitherto imported by British Dominions and Possessions from Germany:—

British India	£6,0[illegible]3,000
Australia	4,457,000
British South Africa	3,560,000
Canada	2,279,000
S. Nigeria	719,000
Straits Settlements	71[illegible],000
New Zealand	[illegible]
Gold Coast	5[illegible],000
Other British Possessions	650,000
Total	£19,172,000

Apart from the Dominions, Germany has now lost her market in the United Kingdom, which has been worth some seventy or eighty millions annually, and indeed it may be said that her entire oversea trade, valued at probably not less than 250 millions, is to-day shattered to fragments.

WANTED:

Position as COLLIERY MANAGER or ASSISTANT to same in Union of South Africa or Rhodesia. Advertiser holds such a position at present; with First Class S.A. qualification and three years' Transvaal mining experience, also practical knowledge of Oil Shale prospective development.
Reply, "CARBON," c/o "S.A. Mining Journal," Box 963, Johannesburg.

Finance, Commerce, and Industries.

A Hint to South Africa.

A new industry has gone to London, gone to stay and to grow—the making of that most popular of perfumes, eau-de-Cologne. There was never any sound reason why it should be made abroad. Every perfumer knew roughly what it contained, though the proportions in which the various essential oils should be mixed was a closely-guarded secret, and it is obvious that the materials, which come from Southern Europe, might just as well be made into perfume in England as in Germany. And so London has a new industry, the making of eau-de-Cologne Anglaise. The idea came to the head of the perfume department at Selfridges. He made inquiries in France, and in an old monastery came across a jealously-guarded recipe for this perfume. He obtained a copy, and the result has been the production of a scent which customers declare to be more lasting and more refreshing than the imported variety.

* * * *

German and British Trade.

"In these days of close and active world commerce, no important event which happens in one country can remain without its effect on the rest of the world." The foregoing words were written by Sir Edward Speyer for "England and Germany," in a review of the economic conditions of the two countries. That they are true is fully borne out by subsequent and prior events. It has become the custom to deplore the fact that most of the foodstuffs consumed in Great Britain are imported, and to lost sight of the equally important fact that nearly all great countries are in the same plight. German writers for some time past have taken exception to the cry from Great Britain that the expansion of the German fleet was explained by the intention of an attack upon England. It was recognised that sea supremacy for Great Britain was a matter of life and death, and it was urged that the possession of a strong fleet was equally necessary for the protection of Germany's commerce. The director of the Deutsche Bank and a member of the Prussian Upper House (Herr Arthur von Gwinner), in an article on "English and German Economics," has stated that Germany produced sufficient food for six days only of the week, and that even if coffee, tea, petroleum, silk, and cotton were eliminated, there would still be a necessity to provide for one-seventh of the German population. He added that, so long as that state of affairs existed, it would be necessary for Germany to possess a fleet sufficiently strong to protect the food imports.

* * * *

Government Advances Against Produce.

It is officially notified that in order to meet the situation caused by the dislocation on the European market the Union Government has completed a scheme whereby cash advances may be obtained against deposits of wool, mohair, skins and hides produced in the Union of South Africa. The notice contains, *inter alia*, the following terms:—

It is hereby notified, for general information, that, in order to meet the situation caused by the dislocation of the European markets, the Union Government has contemplated a scheme whereby cash advances may be obtained against the deposit of wool, mohair, skins and hides produced in the Union of South Africa. 2. Under this scheme one Government agent has been appointed at each of the following ports, viz.: Capetown, Port Elizabeth, East London and Durban. The Government agent at each of these ports will receive, value and store produce of the nature described above, and, as consideration for these services, will be entitled to levy charges not exceeding the amounts specified in Schedule A. These charges will be payable by the registered owner of the produce and will be deducted from the proceeds of the sale thereof. 3. Applications are being invited at the ports for the appointment of Government agent. When the selections have been made the names of the successful applicants will be published immediately. 4. On receipt of the produce, the Government agent will issue to the depositor a produce warrant in the form of Schedule B, which will entitle the holder of the warrant to obtain from his bankers (being either the African Banking Corporation, Ltd., the Natal Bank, Ltd., the National Bank of South Africa, Ltd., the Netherlands Bank of South Africa, or the Standard Bank of South Africa, Ltd.) an advance up to 50 per cent. of the value of the produce deposited. 5. The value of the produce deposited shall be determined on the basis of the average open market prices ruling in the Union during July, 1914. The value shall be determined by the Government agent, whose valuation shall be final. 6. In respect of all such advances interest shall be payable to the banks concerned at the rate of 6 per cent. per annum. 7. The Government guarantees the participating banks against any loss of principal, but not of interest, in respect of advances made by them under this scheme, and the banks undertake to make advances to their customers on presentation of the produce warrants.

* * * *

Sir Felix Schuster on the Banking Position.

As usual, the half-yearly general meeting of the Union of London and Smiths Bank, Ltd., held recently, gave an opportunity to Sir Felix Schuster, the Governor, to pronounce one of his important discourses upon the financial and banking position. This time, Sir Felix uttered a strong word of warning. After explaining how the low rates of discount in the earlier part of the half-year had caused a strong demand for gold for the Continent, and also increased capital issues, Sir Felix came to the conclusion also that trade was diminishing, although it had been pretty well maintained, considering the unsettled conditions, financial, political, and social. He then drew special attention to the question of the gold reserves, which he had also mentioned in former speeches. He drew special attention to the continued accumulation of gold in the great European State Banks. During the last twelve months the Imperial Bank of Germany had added £11,000,000 to her holding, raising it from £54,000,000 to £65,000,000, an increase in two years of £20,000,000; the Bank of France held now £162,000,000, an increase in twelve months of £30,000,000; Russia, £159,000,000, £18,000,000 more than last year. In addition, the Imperial Bank of Germany had called on the other banks of the country to increase their holding of cash in proportion to their liabilities. These additions to the various gold reserves were the result, not of natural commercial or monetary conditions, but of a deliberate policy, and certainly afforded considerably increased strength in the event of grave political or financial difficulties arising. In the United States new banking legislation had taken place, and some of the banks were preparing to enter the field of international banking competition.

* * * *

Government and the Price of Food.

The following statement has been forwarded for publication by the Secretary of the Association of Chambers of Commerce:—

I am directed by the General Executive Committee of this Association to address you on the subject of the great importance at the present juncture of immediate and effective action being taken to safeguard the general community against the undue inflation of prices of commodities, particularly to secure that the prices of foodstuffs shall be kept as low as circumstances will permit. The Government has conferred with the Association on the matter, and assurances have been given that co-operation of the commercial community may be relied upon, and that in this crisis considerations of national good will be placed before individual profit. In giving this assurance the Association felt confident that it could absolutely rely on the commercial community to act up to it to the fullest degree. There are adequate stocks of staple lines in the country to meet present needs, and there is no immediate justification for apprehension as to the maintenance of supplies of the necessaries of life. To strengthen this position the Government has agreed to the recommendation of the Association for a Government guarantee against war risk, of shipments of wheat and flour from Australia. An official announcement in this regard will be published very shortly. The Association desires to impress upon every individual chamber the need for it to recognise its responsibility and duty to exercise to the full its influence in allaying any scaring of people and in maintaining supplies and prices, as far as possible, on a normal basis. More particularly is this desirable in regard to small stores in country districts, about which many complaints have been made. On the Witwatersrand meetings of traders have been held and the position explained, with the result that the objects above indicated have been attained. The public has been notified of the agreement of retail grocers to adhere to a specified maximum list of prices until further notice, and a list of stores at which goods could be obtained was attached. Only in a few instances were these prices in advance of previous rates, and in every case the increase was due to an advance in the first cost. Similar action has been taken in other centres, and if you have not followed this course I am to urge you to do so without delay. The Association is confident that if the matter is taken up in every district in the spirit indicated a satisfactory result will be attained. I am, however, to point out that if co-operation is not secured the interests of the general public may impel the Government to intervene. The Minister of Finance has explained to the Assembly that the principal point which, in the Government's opinion, deserved consideration at the present time, was the possibility of a general rise in the price of foodstuffs occurring simultaneously with a [illegible] serious diminution of employment. As he explained to the deputation, this was a contingency which the Government could not permit to pass unnoticed, and it might become necessary for the authorities to adopt radical measures to prevent such a rise in the cost of commodities.

* * * *

Liebig's Great Ranch. A Pietersburg visitor who has just returned from a trip to Mazunga, Liebig's place in Southern Rhodesia, gives some interesting information regarding this great ranch that is in the making. At Mazunga, which is quite a small town already, the visitor is shown the best the world can offer in the ranching business. Here are situated the administrative headquarters of the company. Mr. [illegible], the manager, knows his South Africa well, and he knows the ranching business from A to Z. The organisation is splendid. A telephone line runs to Mazunga from West Nicholson, and a telephone system connects all the sections of the ranch spread out fan-like some miles from the central headquarters. The men in charge of the various sections are therefore always in touch with the brain-centre of the great undertaking. There are already about 17,000 cattle on this great ranch farm, yet it covers such a vast area of splendid grazing country that the 17,000 is but the nucleus of the great herd which the ranch will comprise, and everything is done to commence the manufacture of the company's products until railway communication between the ranch and the outside world is established. The pedigree stock recently imported is doing well, and, in fact, the whole of the animals on the estate are in an excellent condition, proving what a fine country it is for beef-raising.

* * * *

The S.A. Orange Industry. Large shipments of oranges from South Africa to England are arriving in the market at a time when the demand for the refreshing fruit is at its best. And South Africa is preparing to meet the demand. Nurserymen are booked with orders up to 1916, and all over the Union in districts where there is no—or little—frost, are preparing for orange groves. Oranges have made fortunes for farmers in California, and they are making big money for growers in South Africa. Here is a California estimate: 10 acres with water, £350, 750 trees, £120, cultivation, six years, £330; water charges (six years), £110, total, £890. Worth at end of nine years from £120 to £160 per acre. Compare that with South African figures, and we have the statement of Mr. R. Davis that 300 trees or four acres produced £400 a year. Another planter at Piquetberg estimated his return per tree at 30s., or a selling price of 3s. per 100, and a crop of 1,000 fruit per tree. At 75 trees per acre this works out at £110 per acre. We take also a Fort Beaufort planter's estimate of £80 per acre profit on prices actually realised by his fruit in London. No wonder that one of the dealers predicts that the orange export trade will soon overtake the soft fruit exports in value, and mount up into a very important industry. Mr. H. J. Jager, representing Mr. T. J. Poupart, of Covent Garden, has just visited the Gamtoos River Valley, where there are already many existing groves, and where planting is in progress. The Avontuur-Port Elizabeth line will figure largely in the transport of oranges, for in addition to the Gamtoos groves, the Oudtshoorn people are once more taking to the oranges. On the Gamtoos River there are four co-operative irrigation schemes either under construction or in preparation. These are the [illegible] scheme, with 1,380 morgen rateable, the Gougha Poort with 713 morgen, the [illegible] with 1,543 morgen, and the [illegible] with 4,000 morgen, altogether 15,272 acres. If 10,000 of these acres are put down to oranges that means 750,000 trees. Albany and Bathurst are great orange growers, and at [illegible] in Albany there is a scheme in preparation to water 6,000 acres from the Fish River. Clanwilliam oranges have a name in London, and the Clanwilliam-Van Rhynsdorp scheme under construction will irrigate 13,066 acres from the Olifants River. According to the census of 1911 the crop of oranges was in that year 119,985,284, of which the Cape grew 70,500,000, and the Transvaal 32,400,000. The number of trees bearing was given at 513,202, and non-bearing at 472,399. The average crop per bearing tree was returned at about 240, a low average, worth at 3s. per 100 about 7s. The districts in the Cape containing the greatest number of orange trees in 1911:—

	Bearing Trees.	Young Trees.
Bathurst	31,753	19,945
Paarl	23,792	8,407
Humansdorp	20,606	14,815
Clanwilliam ...	19,568	16,776
East London ...	14,423	9,013
Oudtshoorn	12,038	3,207
Kingwilliamstown ...	10,536	10,433
Piquetberg	9,559	6,638
Stellenbosch	8,390	1,404
Uitenhage	7,752	5,407
Albany	9,938	4,375
Graaff-Reinet	6,377	867
Montagu	5,985	21,113

It will be noticed that Montagu led in creating fresh groves, closely followed by Bathurst, Humansdorp, Clanwilliam, and Kingwilliamstown. Port Elizabeth controls the largest export trade from Bathurst, Humansdorp, Oudtshoorn, Albany, and Uitenhage—116,000 trees. Capetown should control the export from Paarl, Stellenbosch, Clanwilliam, Piquetberg, and Montagu—111,000 trees; while East London has command of the Border districts.

* * * *

"S.A. Mining Journal" Exchange. With the Stock Exchange closed, it has been represented to us that the time is opportune to offer facilities in our advertising columns for the purchase and sale of securities for cash. No speculative dealings, of course, are ever possible through the *S.A. Mining Journal* Exchange. But sellers who desire money for securities they hold, and buyers who desire securities at the present low prices, and are prepared to pay cash can usefully avail themselves of the *S.A. Mining Journal* Exchange. Write stating name of stock or share, the amount and the price required, together with a postal order for 5s. for each item announced, with a stamped addressed envelope. Announcements should reach this office by 5 p.m. on Thursday of each week to ensure publication in that week's issue.

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TREASURY GOLD MINES, LIMITED

(IN LIQUIDATION).

(Incorporated in the Transvaal.)

NOTICE TO SHAREHOLDERS.

NOTICE is hereby given that a General Meeting of Shareholders will be held in the Company's Board Room, Cullinan Building, Johannesburg, on FRIDAY, the 25th SEPTEMBER, 1914, at 11 a.m., for the purpose of laying before the Shareholders an account of the acts and dealings of the Liquidators since the date of the liquidation of the Company, in accordance with Section 168 of the Transvaal Companies Act, No. 31 of 1909.

A. GREGOR,

Acting Secretary to the Liquidators.

Johannesburg, 2nd September, 1914.

THE SOUTH AFRICAN

Mining Journal,

WITH WHICH IS INCORPORATED

South African Mines, Commerce and Industries.

ESTABLISHED 1891.

VOL. XXIV., PART I.] SEPTEMBER 12, 1914. [No. 1198.

HEAD OFFICE: 176-180, Stock Exchange Buildings, Fox Street (2nd Floor), Johannesburg, Union of South Africa.

Telephone **913.** P.O. Boxes **963** and **418.**

Cable and Telegraphic Address: **"MINING JOURNAL."**

AGENTS FOR GREAT BRITAIN: Argus Printing and Publishing Co., Ltd., Byron House, 82-85, Fleet Street, London, E.C.

GERMAN AGENTS: H. C. Wolff, Gerberstr, O. 11, Kempten, Bavaria; Emil Karst, Steinstrasse 44, Leipzig.

AMERICA: Advertisements accepted from any recognised Advertisement Agency.

ANNUAL SUBSCRIPTION RATES: Oversea, £2; South Africa (by post), £1 10s.; Local Delivery (Town only), £1 6s.

Copies of this journal are obtainable at all Branches and Agencies of the Central News Agency, Ltd., at all News Agents and Railway Bookstalls throughout South Africa, and at the London Agency as above.

NOTICE.—The postage of this issue of the *S.A. Mining Journal* is: South Africa, ½d. All other parts, 1d.

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Notes and News.

What the Mines are Doing to Help.

The men on the mines of the Rand, though recognising that by keeping the gold output up they are performing service to the Empire no less useful than if they were in the firing line, are nevertheless eager to help in other directions. Thus it would seem that the white employees of practically every mine on the Rand have now decided to apportion at least one day's pay per month to the War Relief Funds as long as the struggle lasts. This means, say, that 2·5 per cent. of the total salaries and wages paid out by the mines of the Rand will be handed to these funds. As the total of the wages and salaries paid out in a year by the gold mines approximates to £8,000,000, it will be seen that upwards of £200,000 will be subscribed by the white employees of the mines, assuming that the war continues for a year! Well done, the mines!

* * * *

Official Warning to Share Certificate Holders.

The Board of Trade has issued the following warning, which *mutatis mutandis*, applies to other securities:—"British holders of American Railroad shares and Canadian Pacific Railway Company shares who have not had the shares registered in their names are advised to examine their certificates, and, if the registered holder is a German or Austrian or a German or Austrian company, to take steps at once to secure registration in their own names. This advice applies with special urgency to shares in the Canadian Pacific Railway Company, as the company's books are about to be closed for the payment of dividend."

* * * *

Difficult Problems for Solution.

In an article on "Insurance and the War," the *Economist*—which seemed in the crisis better at raising questions than answering them—says:—"Already difficult problems of law are arising out of captures, and lawyers and average adjusters are being bombarded with thorny problems for their decision. For example—(1) English cargo in a German steamer captured at Antwerp. Will that be a loss to the British owner? (2) English cargo at sea consigned to Germany in German vessels, but not yet paid for by the German customer. Will that, if captured, be a loss to the British owner? (3) English cargo in a German steamer that puts into Lisbon. Will that be a loss to the British owner? They are difficult points, and so far no one has solved them satisfactorily. Whatever the ultimate solution, it is clear that, under modern conditions, the capture of private property at sea is a far more tangled business than most people had realised before the war broke out. Whatever the strategical advantages of hampering German commerce, it is impossible to carry out the systematic capture of German steamers without injuring either British underwriters or British merchants."

* * * *

British Manufacturers' Opportunity.

A Manchester correspondent writes:—Vigorous efforts are being made by British manufacturers in the North, particularly in the electrical and chemical industries, and many sections of the cotton trade. The British Westinghouse Electrical and Manufacturing Company has, since the outbreak of the war, received important orders from Norway and elsewhere which, it is affirmed, would otherwise have gone to Germany. Similar reports come from other important electrical, general engineering and textile machinery concerns in the Greater Manchester district, some of which are now preparing to open out new departments. Most engineering works would already be very busy but for financial questions—mainly the existence of the moratorium, and the absence of normal facilities for bill discounting. These are in process of rectification.

Remission of Claim Licences.

One of the consequences of this war has been the stoppage of work on almost all "outside" developing mining properties. At a period when capital which is not earning profits is called on to finance work on unproductive propositions must of necessity cease. The Government have accepted this thesis, and they have closed down the Premier Diamond Mine; they have stopped all public works, etc. It is urged that the Government, as owners of all gold claims, should not exact from the claim-holder who is not working his claims, and cannot work them at the present moment owing to lack of capital, the payment of licence money. Of course, where mines are working and paying expenses, of which the licence or tax constitutes portion of the expenses, they should pay as usual. An application was recently made by the Small Mines and Claimholders' Association, on behalf of the holders of diggers' and prospectors' licences, and small mine owners generally, to the Minister of Mines, asking for a remission of claim licences on claims which were not being worked in a beneficial manner. The reply was that, whilst the Minister sympathised with the applicants, and recognised the justness of the request, there was no machinery in the Gold Law that enabled him to carry out such a proposition. That omission can, however, easily and speedily be made good.

* * * *

German Banks in London Re-opening.

As had been expected, the British Government has granted the Deutsche Bank, the Dresdner Bank and the Direction der Disconto-Gesellschaft, and the Austrian banks licenses to continue business in London. The official announcement shows that strict limitations have been imposed and that the operations are to be subject to supervision. Indeed, the permission to continue business only extends to the completion of banking transactions entered into before the 5th of August and to such other transactions as will be necessary for making the realisable assets of the banks available for meeting their liabilities. Any assets remaining after these liabilities have been discharged are to be deposited with the Bank of England, to the order of the Treasury. These are very stringent conditions, but they will permit of the payment of drafts and the discharge of other liabilities in London, which is greatly to be desired because it will remove a hardship which was being imposed on many British subjects who had credits at the German banks.

* * * *

S.A. Red Cross Society.

The mines are greatly assisting the work inaugurated by the Red Cross Society in providing comforts for the troops and hospitals, both in South Africa and overseas. On most of the mines ladies' working parties are actively at work, the Knights Deep ladies, under Mrs. J. H. Wilson, being the first to despatch a consignment of over 500 articles of equipment for the First Field Ambulance, which left last Sunday and Monday, while magazines and books have been supplied by it to the Transvaal Scottish, R.L.I., and the I.L.H. on the trains by which they left. Apart from the Medical Staff Corps and the Railway Engineers, there has been no demand for ambulance men, but should they be required later no doubt a call from the Red Cross Society would bring a ready response from its certificated holders, of whom there are now nearly 500 along the reef.

* * * *

The New Currency Notes.

The issue of £1 currency notes by the Treasury is now in popular general use in Great Britain, and in view of the possibility of a similar issue in South Africa, it is of interest to notice the provisions of the Bill, which has now become law, authorising the issue of these notes. A summary of its contents follows:—The Treasury may, subject to the provisions of this Act, issue currency notes for one pound and for ten shillings, and these notes shall be current in the United Kingdom in the same manner and to the same extent, and as fully as sovereigns and half-sovereigns are current, and shall be legal tender in the United Kingdom for the payment of any amount. The holder of a note is entitled to obtain on demand at the Bank of England payment for such note at its face value in gold coin. It should here be emphasised that while such provision is made for the conversion of the notes into specie, the best ends of the community at large will be served by keeping the paper in circulation, and it is to be hoped that unnecessary conversion of notes will not take place. The notes will be deemed to be bank notes within the meaning of the Forgery Act, 1913, and any other enactment in force relating to offences in respect of bank notes. The issue of postal orders as legal tender is a temporary convenience, and has been decided upon to meet immediate exigencies. The Bill also grants the Governor and Company of the Bank of England and any persons concerned in the management of any Scottish or Irish bank of issue permission to issue notes in excess of any limit fixed by law. In Scotland and Ireland also bank notes of the respective countries are to be made legal tender for the payment of any amount and are payable on demand at the head offices only of the banks of issue and in currency notes if necessary.

* * * *

German South-West African Facts and Figures.

Among the things which may have contributed to the present outburst of German military insanity is the recent prolonged period of good trade, of which Germany, as well as Britain, has had a full share. Like that of the Fatherland, German Colonial trade was prosperous during 1913, and Mr. Consul E. Müller reported on the trade of German South-West Africa to the effect that a satisfactory half-year was experienced up to June 30, 1913. For this period the total trade value was £2,351,100, which compares with the year's figures for 1912 of £3,517,100 and for 1911 of £3,632,200. This improvement was stated to be due entirely to the mining industry, and especially the diamond industry, which was rapidly developing into a very valuable asset. German South-West Africa has an area of 322,450 square miles and a native population of 80,000 belonging to the Hottentot and Bushman, the Bantu, and the Damara races. The European population is 14,816 (12,292 German), and the military force (inclusive of police) is 2,992 men. The chief industry is pastoral, but there is an important diamond industry. The revenue and expenditure for this year were put at 54,140,000 marks, 48,260,000 marks being for Imperial contribution. There are 1,304 miles of railway open. It may be remembered that in the course of a paper read at the recent annual session of the South African Association for the Advancement of Science at Kimberley, Mr. Wm. Versfeld, B.A., D.Sc., described the geological structure of portions of German South-West Africa, and, dealing with the central portion of Great Namaqualand, extending from the Orange River to Keetmanshoop, Mr. Versfeld said: "The possibility of finding gold, at any rate in the primary formation, did not seem great, as he had examined numerous quartz reefs and conglomerates, and found them particularly poor in that metal." With reference to the Warmbad part of the country, Mr. Versfeld expressed the opinion that though it was so far disappointing with regard to the occurrence of minerals of commercial value, it seemed possible that many discoveries would be made when the population increased and the surface was thoroughly prospected.

* * * *

The Moratorium.

A moratory law, as the authorities express it, is "a law passed in times of emergency postponing for a specified time the due date of bills of exchange and other obligations." The delay, or period of grace allowed by the law, is a "moratorium," and, states the *Law Journal*, there are two degrees of moratoria—a minor and a major—the minor applying only to bills of exchange, and the major including these and all other contracts which enforce upon a debtor the liability to make money payments to a creditor at a fixed time. It is only a partial moratorium of the former kind which was established by the Bill passed through the House of Commons, for it applies only to bills of exchange, and limits the term of postponement to one month. The effect of it is to relieve persons who cannot meet their bills from having them enforced during the period of grace on the terms that their ultimate liability shall be increased by the addition of the month's interest at the current rate. Once a moratorium is proclaimed it is usually continued by successive prolongations till the emergency has passed which gave occasion for it, and it may be assumed that, as in the case of France in 1870, the moratorium will be continued until the end of the war. Among the temporary expedients that may be adopted by the Government to relieve the economic strain will be the postponement of the period of payment of loans and mortgages so as to exclude proceedings to enforce such obligations during the war. There has been no moratorium in Great Britain for over a hundred years, but one has to go back to Napoleonic times to find a parallel for the present emergency.

* * * *

Union Statistics for July.

The official mining statistics for last month contain the half-yearly statement of the diamond output. The total production was 2,262,817·75 carats, of a value of £4,198,901. Of the total the Transvaal contributed 922,230 carats, the Cape Province 1,100,062 carats, and the Free State 240,525 carats. The output of the two producing mines in the Pretoria district was 898,069 carats, representing a value of £862,628, and that of Kimberley was 1,026,974 carats, value £2,572,683. The principal contribution from the Free State came from Fauresmith, amounting to 183,604 carats, of a value of £561,180. The coal output for July was 767,033 tons, valued at £203,626, which constitutes a record for the past twelve months. The Transvaal output was 463,813 tons, Natal 233,884 tons, Free State 63,616 tons, and Cape 3,311 tons. The labour position on the mines in July showed a continuance of the improvement that had become marked since January. There were 29,512 whites employed, and 258,903 coloured, the former showing an increase of 65 and the latter of 154. Of the total 21,463 whites and 170,864 coloureds were employed on the Witwatersrand area.

* * * *

Zinc.

Zinc has had a further rise in price, the last quotation from England we heard being about £40 per ton, whereas before the war the price ruling was little more than £20 per ton. Zinc, as a constituent of brass, is used in war material to a large extent, and the rise in price is due largely, if not entirely, to the stoppage of the German and Belgian zinc smelting works. These smelters have been dealing with the whole of the zinc concentrates of the Broken Hill mines, but a scheme is now on foot to establish smelters in Great Britain to deal with the product of these mines.

* * * *

Dealings in Base Metals.

The Metal Exchange, like the Stock Exchange, was closed for the whole of mail week, but a fair amount of metal changed hands privately. Copper and spelter (zinc) received chief attention, the demand for electrolytic copper having been particularly strong. At one time £72 per ton was paid and there remained further buyers, but at the close the value was probably about £67 per ton. Standard copper was also dealt in. It was stated that £61 per ton had been given during the week, but it was afterwards sold at prices ranging from £59 to £59 10s. Tin was valued at about £142 per ton, but small quantities for specified deliveries realised an average of £150. With regard to the statement that £200 per ton had been paid in New York for tin inquiries failed to elicit any confirmation of the transaction, but it was credited in most quarters owing to the fact that practically the whole of New York's tin supply has been cut off. It was pointed out, however, in respect of the high price mentioned that everything depended upon the rate of exchange. Zinc was quoted round about £26 per ton, while we understand that in Birmingham as much as £28 was given for one-ton lots. There is at present a very great demand for the metal, but consumers are experiencing extreme difficulty in obtaining supplies. Indeed, it is reported that some intending purchasers have had to buy brass. Lead was priced about £21.

TOPICS OF THE WEEK.

THE WAR AND THE MINING OUTLOOK

"*In reply to your enquiry, I think that so long as the British fleet retains her command of the seas there seems to be no reason to anticipate that the working of our mines will be affected.*"—J. Munro.

In this pregnant, laconic sentence, Mr. John Munro, of the Johannesburg Consolidated Investment Co., gives his opinion in regard to the possible effects of the prolongation of the war, but who will say that it does not admirably sum up the position? From Mr. Francis Oats, the Chairman of De Beers, at Kimberley, we have received the following very significant statement: "In reference to your favour of the 3rd inst., I think we have all been too willing to buy German products to help our mining industry. If we are successful in this war, I think that tendency will cease, and as charity begins at home, we shall buy British goods, while, possibly, factories for the making of many articles, etc., now generally supplied by Germany, will be started in the Union of South Africa. For the rest we must 'wait and see,'—but the strain of this war on our resources will be so great that a great feeling of resentment against Germany and anything German will result. The mailed fist, the rattling sabre, the shining armour, etc., are phrases we have become tired of, and for the world's interest as well as our own interests, we have heard the last of them. I do not think we shall buy German locomotives or German railway lines for a long time, if Belgium is able to supply them to us, as I hope she may do, because Belgium deserves all the recognition we can now afford her gallantry, which hindered the Germans for weeks in the march to France." In a separate article appearing overleaf, we deal with the important issues raised by Mr. Oats, and the subject is of such moment as to merit a whole series of articles. In our next issue prominence will be given to a further selection of representative views on the financial, mining and engineering phases of the present struggle.

THE FINANCIAL AND COMMERCIAL POSITION.

IT is now possible to gauge from the mail papers the full measure of the success achieved by the leaders of finance and commerce in London, acting with the Government, in combatting the disintegrating effects of the first critical days of the war. The action of the Imperial Government in guaranteeing to the Bank of England the discount of approved Bills of Exchange had a most important effect in liberating the resources of the banks. The Moratorium has also reassured the public, but it is evident that it will have to be prolonged for the present, and while the fate of the struggle hangs in the balance. The machinery of the Money Market is gradually getting into operation again, although it must obviously take some time before it gets into full swing, and all the arrears in connection with pre-Moratorium bills are cleared up. Favourable developments are the establishment of branches of the Bank of England in Canada and the arrangements with the banks in this country. The former will at once remove the financial embargo upon foodstuffs, while the latter will enable credits to be opened in London immediately against the deposits in our banks of the gold production of South Africa. The Imperial Government and the high financial authorities are also seriously considering the question of the re-opening of the London Stock Exchange. The fixing of loan and discount rates in the Money Market should be a helpful factor, and it is obviously to the interests of the banks and other large financial institutions to help on the movement as much as possible, if only because they themselves are the largest holders of gilt-edged securities. Much must obviously depend upon the duration of the Moratorium. Thus, in a notable letter to the Press, the Chairman of the London Chamber of Commerce writes, *inter alia*:

> It may be of interest at the present juncture to state what I have [illegible] in another than an official capacity, as the result of numerous conferences and interviews with representative business men during the [illegible]. During [illegible] time the London Chamber of Commerce has been used as a centre for consultation and concerted action both among their members and in conjunction with Government departments and committees charged with conserving the interests of commerce. In the first place I have been greatly struck at the numerous meetings, etc., at which I have presided or in which I have taken part to find a total absence of anything like panic either as to the present or the future. The action of the Government, the bankers and the Committee of the Stock Exchange in relation to finance and commerce, combined with the strong measures which have been taken in relation to the supply of food, have inspired the greatest confidence among the business community. Little has been heard by way of protest against the war or the measures [illegible]. As [illegible], the main questions considered were the adjustment of difficulties relating to payments, the means of fulfilling contracts, insurance against war risks and the establishment of a general moratorium adapted to the exceptional circumstances. Solicitude was shown chiefly that the existing system of credit should not be unnecessarily disturbed, that the industrial population should be kept at work or partly employed as long as possible, and that adequate and cheap food supplies should be maintained.

Another authority who had taken a leading part in the conferences of the London bankers and of the Emergency Committee spoke freely to the Press on the situation after a week of war. With the new currency arrangements in operation and running smoothly, he said there was a little breathing space for bankers after the pressure of the week, but there were still many points which required attention. Summing up the events of the week, however, he remarked: "On Sunday before Bank Holiday there was a conference of bankers, and since then we have arranged three extra Bank holidays, drawn up and obtained a general moratorium, which was not an easy matter, formulated a new currency system, and put that system into smooth operation. Added to that the Navy has been mobilised and put to sea, and the Army put on a war footing. That is not a bad record for one week for the 'rotten old country,' which some of our competitors have been saying is played out."

ENGINEERING PROSPECTS IN THE STRUGGLE.

That the war must have an enormous effect on British and Colonial engineering firms and machinery makers is obvious. It is everywhere recognised now that at the present juncture a unique opportunity occurs which, if taken advantage of, would not only materially alleviate the distress inevitable in association with the war, but would undoubtedly prove a fruitful and permanent source of employment both in the United Kingdom and the colonies. It is obvious that the war between ourselves and Germany and Austria has stopped the supply to the British Empire of a large number of goods which have hitherto been imported from those countries. The demand for these goods will, of course, be continued, and there is every reason why we should now supply ourselves with these goods and thus give our workmen the benefit which will undoubtedly accrue from industries to which a great impetus will be given. In fact, now is the psychological moment for British and Colonial manufacturers to substantially increase their business; the combined imports into Great Britain from Germany and Austria have amounted to about £80,000,000 per year. Below is a list of some of the goods which have been imported in great quantities from Germany and Austria, both into England and the colonies, and might now be manufactured by ourselves:—Asbestos goods, cement roofing, tiles, etc., iodine, bleaching and aniline dyes and other chemicals, electrical goods, engineering, headgear (soft felt hats), machine tools and small tools, cutlery, toys, confectionery, saccharine, aluminium and tin ware, enamelled ware, barbed and other wire, jewellery and ready-made clothes. Another point which must not be overlooked is that, the war having brought Germany's and Austria's trade completely to a standstill, we might find a market for the above goods in directions hitherto supplied by those countries. Another of the effects of this war while it lasts will unquestionably be to cause British engineering firms to purchase much more of their materials in the Empire than is usually the case. They may have to pay more for them, but that cannot be helped. The makers of such materials must meet them in the matter as far as possible. Too often of late years, while preaching the doctrine that British plant is the best, we have been inclined to buy our materials in the cheapest market. The policy of inter-purchasing between manufacturers within the Empire, so strongly advocated by the British Engineers' Association, must be developed. Now is essentially the time to begin a more patriotic policy than in the past. The policy of British materials for British firms cannot, of course, be carried out in its entirety, but it can be to a much greater extent than heretofore. Yet another benefit which our engineeriig firms should derive from this terrible war is, always assuming that it is carried to a successful issue, that for a long time, at all events, the air will be cleared of that unhealthy and often dishonest class of foreign trade which has been gradually eating its way into the methods of placing engineering contracts abroad. Germany is the country which has introduced and fostered this pernicious system, and we hope that the war will clear the markets of her influence for many years to come. We do not object to foreign competition on open and above-board lines; but the methods of some German manufacturers, due no doubt to the fact that they could not obtain business in a legitimate manner, have been such as to create absolutely unsound conditions which must cease when the credit of that country has been destroyed. That credit, which has been held together by a very fine thread of late years, was well on the way to disruption before the war commenced. It has snapped with a bang during the last few weeks, and every hour between now and the end of hostilities can only render matters worse for Germany. Meanwhile our manufacturers, with all the fortitude in their power, must face the difficulties of a temporarily collapsed trade, strong in the conviction that when the war is over their position will be far stronger than it has ever been. It may be added that Germany's important overseas electrical trade has been ruined for the time being, and it would seem that a great opportunity is presented to British manufacturers to neutralise loss of European trade by extended operations at the expense of former competitors. This applies particularly to Great Britain itself, which has absorbed over £150,000 worth of German electrical goods a month in recent times, the absence of which must offer scope for the expansion of the internal electrical trade of the home manufacturer, with effects which should be not merely temporary, but permanent in character. It should be recognised that our industries, such as can be kept going, represent the indispensable reserve force on which both combatants and non-combatants depend—in fact, the mainstay of our national existence. It is incumbent on us to use this weapon of industrial warfare in a time of stress, no less skilfully than those of our brothers in arms will be used when occasion arises. As for the future, we may express the view that, taking it for granted that the war will result in the overthrow of the German naval and military power, as we all hope and believe, the cut-throat competition from which British manufacturers have suffered in the past will be removed, the exploitation of the British Dominions and Colonies (of which the Rand is so conspicuous an example) will cease, and a large volume of foreign trade will be diverted from the Continent to British workshops. Thanks to the mad policy which has been followed by the German Government, the sympathy of the whole world has been alienated, and Germany stands almost without a friend but Austria. The prime essential at the moment is to obey the call of duty, which comes to every one of us; then we need not fear the result. British manufacturers have patriotically obeyed the call, and, as one correspondent says, "business will go on as usual." That is, in a nutshell, the watchword of victory.

SAFETY DEVICE FOR HANGING UP MILL STAMPS.

Advantages of Dick's Device—Patriotic Offer by the Inventor—Recent Preventable Accidents.

For several reasons it is desirable again to call attention to the advantages of adopting Dick's safety device for hanging up mill stamps. In March last the following circular was issued to all Rand mine managers by the Mine Managers' Association :—

> The attached drawing *re* the above shows the working design of a device which has been prepared by a practical mill man, who has had many years' experience on these fields, and who received a severe injury to his hand some time ago as the result of a stamp falling accidentally on it. The locking bar has not necessarily to be fitted to *each* set of five stamps, as it is interchangeable and can be moved to whichever battery it is desired to hang up, provided that the necessary rest sockets are attached to each king post. The bar can be made of any cheap material, such as old boiler tubing, provided it is sufficiently strong. As this device has been got out in response to an appeal to employees by the manager of the Geldenhuis Deep, Ltd., at the instance of the Prevention of Accidents Committee of the Rand Mutual Assurance Company, Ltd., it is put before the Mine Managers' Association on the understanding that for each of such mines as the suggestions given in the drawing are acted upon, a bonus of £5 shall be paid to Mr. Dick by the company using the device; such payments may be made either through the Association of Mine Managers or the Rand Mutual Assurance Company, Ltd. It is considered only fair that such ideas as this unreservedly given out to the industry, without being patented, in response to appeals for suggestions on safety devices, should be encouraged. If they are worth putting into practice, the small bonus to the originator referred to above will be an inducement to others to bring forward their ideas.

Since then, on September 1st, the following letter has been received by Mr. J. F. Bilbrough, managing secretary of the Rand Mutual Assurance Company, Ltd. :

> Dear Sir.—With the object of contributing to the various funds which are being raised on the Rand for the alleviation of distress which is anticipated will occur as a result of the coming campaign in South-West Africa, I would esteem it an honour if you would devote the whole of all royalties which may become due me for the installation of the safety bar in stamp mills on the Reef to this purpose. This to take effect from September 1st. I would suggest the Governor General's Fund should have the first consideration, and also that a proportion be given to the Belgian Widows' Fund—the Belgian soldiers be men indeed! It occurs to me that many mining companies would adopt the safety bar if they were aware of what is to be done with the royalties, and I feel certain the Chemical, Metallurgical and Mining Society would give you every assistance in their power to further the scheme. As an old soldier, my sympathies are with the wives and families of the gallant fellows who are now taking the field for the preservation of the British Empire, and my only regret is that, up to the present, this great honour is denied me, whatever the future may have in store.—I am, dear sir, yours faithfully, Otto E. Dick.

Recent Happenings.

Since the first circular was issued in March, 1914, several mines have adopted this or similar devices, and, of course, it is not suggested that no such devices were in use before. From recent accidents, two things are, however, evident, viz. :—(1) That many mills are not fitted with this or any similar device; and (2) that even when fitted the devices are not used. A case in Germiston district occurred this week to support the first point. A young mill worker has had both thumbs and half of the right index finger amputated as the result of a falling stamp. The previous week the manager was discussing with his battery manager the advisability of installing a safety bar; needless to say, the point has now been sadly and emphatically emphasised by the accident, and the bars will be put in at once. But the proper time to prevent an accident is before it happens! The second point is illustrated by the case of an accident in Boksburg a couple of months ago. A learner had occasion to change the dies in a battery, and asked the assistant amalgamator "what about putting on the safety clamps?" But it was not considered worth while. There is a conflict of evidence as to whether the learner, the assistant amalgamator, or the shiftsman should have absolutely insisted on the stamps being clamped, but the result is the same: the device supplied (*not* Dick's) took too long to put into use and was not used, a stamp inadvertently fell, and the unfortunate learner's hand has been rendered permanently useless; he is young, was recently married, and now has to go through life with only one useful hand. There were notices up in the mill, and specific instructions had been given that on no account is any work to be done in the mortar boxes without first attaching the safety clamps. All these facts taken together will, it is hoped, give a fillip to the adoption of the Dick's device.

MINING MEN AND MATTERS.

Messrs. Harvey & Russell, Ltd., of this town, have been appointed agents for Messrs. P. & W. Maclellan, Ltd., the well-known steel constructional firm, of Glasgow.

* * * *

The following is an official list of certificates issued by the Mines Department for the month ended August :—Mine surveyors: G. McConnell, R. Gurnell, J. M. Boyce, H. C. Boydell (honours). Mine overseers—metalliferous: A. W. Lewis, H. T. d'O. Kuehn, D. D. Davies, G. Wade.

* * * *

Mr. Woolf Joel, son of Mr. Solly Joel, has joined the ranks of Royston's Natal Light Horse. He came to South Africa some months ago to make himself conversant with the mining industry, but when the patriotic call came after the outbreak of the war he quickly volunteered for service, and is now a private serving under Colonel Royston.

* * * *

At the last meeting of the S.A. Institute of Engineers, the President (Mr. E. J. Way) said the resolution to discuss the Presidential address was placed before the Council and thoroughly discussed. It was unanimously resolved that precedent should not be interfered with, and that the Presidential address should not be held open for discussion by the Institution.

It is notified for general information that His Excellency the Officer Administering the Government has been pleased to declare, in terms of Sub-section (2), Section 6, of the Public Service and Pensions Act (No. 29 of 1912), that the degree of Bachelor of Science in Mining (Cape) be regarded as equivalent to the pass degree of Bachelor of Arts of the University of the Cape of Good Hope; with effect from the 1st August, 1912.

* * * *

The monthly meeting of members of the Geological Society of South Africa was held in the Council Chamber, Chamber of Mines, on Monday evening. Messrs. George W. Kent and A. M. MacGregor were elected members of the Society. There was a short discussion on Dr. Rimann's paper, "The Outlines of the Geology of German South-West Africa," by Mr. A. von Dessauer. Mr. Von. Dessauer, on behalf of Mr. Du Toit, read a short paper on Dr. Young's paper, "Note on Pyritic Concreations in Karoo Sandstones." A paper by Mr. E. V. Zealley, Acting Director, Geological Survey of Southern Rhodesia, "The Geology of the Chromite Deposits of Selukwe, Rhodesia," was read on behalf of the author by Dr. G. S. Corstorphine. This paper was illustrated by maps, sketches, and photographs. Several members took part in the discussion, and the meeting terminated with votes of thanks to the author and to Dr. Corstorphine for reading the paper.

IMPROVED POSITION OF THE RAND NATIVE LABOUR SUPPLY.

Chairman of the N.R.C. Makes Most Satisfactory Statement—Rapid Increase in Boys Coming Forward Voluntarily.

Mr. C. W. Villiers gave a most reassuring account of the native labour position on the Rand at the annual meeting of the Native Recruiting Corporation, Ltd., held a few days ago. *Inter alia*, he said:—

The total number of natives recruited by the corporation in British South Africa during the twelve months ended [illegible] was [illegible]. In addition to this number [illegible] British South African natives were recruited by contractors, and [illegible] East Coast natives were supplied by the Witwatersrand Native Labour Association; [illegible] natives came direct from their homes to engage voluntarily with the mines, of whom [illegible] engaged during the six months ended 30th June, 1914; a further [illegible] natives either changed from the employ of one mine to another or from other employment to work on the mines, and [illegible] natives were transferred from mines which, for various reasons, were closed down, making a grand total of [illegible]. The number of natives engaging on the gold mines voluntarily is increasing rapidly, as is shown by the following figures, which refer to the whole gold mining industry and not to the mine members of the Native Recruiting Corporation only: From the 1st January, 1914, to the 30th June, 1914, out of a total number of 80,921 British South African natives coming from their homes to work on the mines [illegible] were voluntaries, equal to 34·73 per cent. of the total incoming new boys from British South Africa; and of the total incoming native labour supply, including East Coast natives, [illegible] were voluntaries, equal to [illegible] per cent. The present position of the native labour force shows a considerable improvement as compared with the position at the 31st December, 1913, at which date the general average percentage of underground complement was 59·94 per cent., whereas at the 31st July, 1914, the general average percentage had risen to 71·15 per cent. Since the 1st July, 1913, 12,726 Tropical natives have been repatriated, and no more natives have been recruited from Tropical areas. There is every prospect of a considerable increase in the labour supply during the next few months, due to the scarcity of food in the native territories, and also to the temporary closing down of the diamond mines. The distribution of natives among the mines has now been placed on a much more satisfactory basis owing to the strict enforcement of the terms of the agreement entered into between the various mines and the corporation. For a period, the terms of the agreement were not strictly adhered to, as it was feared that it might have a detrimental effect on recruiting, which, in practice, has not proved to be the case. The chart attached to the report shows clearly the fluctuations in the native labour supply, which have been unusually severe owing to the great exodus of natives during and after the industrial disturbances in July and August, 1913. The schedule of native wages has been amended from time to time, especially as to the rates of pay on machine piecework, the maximum average clause having been abandoned, and no limit put on a native's earnings on this class of work. The average rates for piecework tramming and lashing have been placed on a more satisfactory basis, and it is hoped that the system of piecework will be largely extended on the mines. During the period under review many changes have been made in the system of making advances to natives before they come to work, but it is now anticipated that this most vexed question, as also the whole system of recruiting native labour, will be put on a sounder footing based on the recommendations made by Mr. H. O. Buckle in his report on native grievances. I wish to take this opportunity of thanking the mine managers and the compound managers for the cordial manner in which they have supported the corporation during the period under review. The success attending the corporation's efforts in endeavouring to supply the mines with the requisite amount of labour is largely measured by the treatment meted out to the natives on the mines, and it is satisfactory to note that the conditions under which the natives work on these fields continue to improve. On behalf of the board, I desire to express thanks to the staff of the corporation for their loyalty and energy, and I also wish to express gratitude to the Native Affairs Department, the Director of Native Labour, and the Witwatersrand Native Labour Association for their co-operation and assistance during the period under review.

Correspondence and Discussion.

Comments on Questions Arising in Technical Practice or Suggested by Articles in the Journal—Views, Suggestions and Experiences of Readers.

Natal Wattle Bark Industry.

To the Editor, *South African Mining Journal.*

Sir,—Owing to the disturbed conditions now prevailing in Europe, the above industry has been practically brought to a standstill, on account of the wattle bark buyer having centred this industry in Hamburg, Germany. Under these circumstances, the stripping of the wattle trees during the present spring season, will have to be delayed in consequence of the export market being closed. Last year's exports of wattle bark totalled some 65,000 tons, which at a low average of £4 10s. per ton equals £292,500 deferred payment to the Natal wattle growers for the season 1914, based on the 1913 returns. It has occurred to me to lay before you the forenamed loss for the season 1914 with a view to calling the wattle growers' attention to the necessity of forming themselves into a limited liability company for the purpose of raising capital to establish wattle bark extraction factories in convenient centres of the Natal wattle growing district. These factories would produce the tannin extracts in the right condition for British farmers' requirements. We find the British market object to handle the wattle bark in its present exported condition as supplied to the Hamburg merchants. I observe published in the *British South Africa Gazette* that tenders are being called for wattle extract plant. This journal states that the purchase of a plant costing £20,000 for manufacturing wattle extract is to be taken in hand by a company formed for the purpose at Pietermaritzburg, Natal. The plant should be capable of dealing with 6,000 tons of raw material annually. Basing the provisional calculation on the above amount of £20,000 being capable of treating 6,000 tons, of of raw bark, the present output of bark would require ten factories to treat the year 1913 quantity of bark. Ten factories at £20,000 each equals £200,000. Two hundred thousand pounds capital required to manufacture their product into a marketable article suitable to British requirements. This would obviate the expense of long railage charges to the coast ports, and it would save the shipping expenses in bulk form to the port of Hamburg. The means of raising the capital for this object might possibly be secured on the following plan being adopted by all those engaged in the wattle industry: (1) That for every acre of land under wattles the owner should guarantee to subscribe £1 or more to the company, such guaranteed amount to be deducted from the value of his wattle bark returns when settlement was made; (2) the guaranteed amount could be extended over a period of one or more years, according to the discretion of the board of directors; (3) the capital being raised under the above guarantees would in the course of time be returned to the original lenders, and in the meantime gradually bring a co-operative wattle growers' manufacturers' extract company into permanent existence and thus help to establish a profitable business for their growing industry. The present position in which the wattle growers and buyers are placed in to-day is one that requires every assistance to overcome this serious loss to those engaged in this industry. The present moment appears one favourable to proposing the flotation of these ten companies for this purpose, which should prove valuable to all concerned and of future benefit to the trade returns of the country. As a subscriber to your journal, I forward the above views on the wattle growers' prospects for the year 1914.—Yours, etc.,

WM. WAYNE, Sen.

Durban, September 5th, 1914.

THE AUGUST OUTPUT: GROUP RETURNS.

Total Over £3,000,000 Again—Native Labour Force Growing.

THE August output was declared this week as follows:—

Total output	711,918 ozs.
Value	£3,024,037
Decrease	20,567 ozs.
Value	£87,361
Witwatersrand	684,607 ozs.
Value	£2,908,025
Decrease	18,529 ozs.
Value	£78,706
Outside Districts .. .	27,311 ozs.
Value	£116,012
Decrease	2,038 ozs.
Value	£8,655
Total stamps	9,819
Increase	21

Rand Mines Group.

The following are the results of crushing operations of subsidiary companies for the month of August:—

Company	No. of Stamps Running.	Tube Mills.	Tons crushed.	Estimated Working Costs per Ton.	Total Fine Ozs.	Total Estimated Profit.
Rose Deep ...	300	7	55,700	16/ 8·3	15,570	£19,006
Geldenhuis Dp..	300	7	49,800	21/10·2	15,637	11,350
Nourse Mines ..	260	7	53,400	19/ 2·2	15,835	15,347
Ferreira Deep ..	280	7	59,760	16/ 9·5	23,851	50,115
Crown Mines ...	660	26	208,000	15/ 7·2	60,323	91,398
Durban Rood. D	100	3	26,830	22/10·7	8,655	5,625
Tls. and averages	1900	57	453,490	17/ 5·2	139,871	£192,841

The following are the results of crushing operations of Central Mining companies for the month of August:—

Company.	No. of Stamps Running.	Tube Mills.	Tons crushed.	Estimated Working Costs per Ton	Total Fine Ozs.	Total Estimated Profit.
Modder B. ...	96	5	40,000	15/ 2·1	15,762	£35,988
New Modder. ...	180	7	52,500	14/10·2	22,988	57,804
City Deep	150	9	43,500	21/ 2·1	18,137	30,178
Village Deep ...	180	7	52,700	17/ 5·6	16,892	24,946
Village Main R.	160	4	35,000	16/ 8·9	15,079	34,100
Robinson.	250	6	57,000	14/ 0·3	21,168	49,079
Bantjes Cons. ..	100	3	22,000	21/ 2·7	6,324	3,241
Tls. & averages	1116	41	302,700	26/ 9·4	116,350	£235,336

Most of the companies exercised economy in zinc, and as a result the recovery of a portion of the gold has been temporarily postponed.

Barnato Group.

The results of operations of the Barnato group for August are as follow:—

Mine.	Stamps.	Tons Crushed.	Revenue from Gold.
Consolidated Langlaagte .	100	51,500	£63,922
Ginsberg	75	15,147	16,593
Glencairn	160	21,923	15,280
New Primrose	155	23,300	26,259
New Rietfontein	60	8,622	7,045
New Unified	60	13,450	14,159
Quest	35	1,309	2,610
Van Ryn Deep	80	12,230	70,111
Witwatersrand ..	210	15,950	52,135
August totals	935	226,431	£268,114
July totals	930	232,439	£275,845

Mine.	Total Working Costs.	Working Costs per Ton Milled.	Gross Profit including Sundry Revenue.
Consolidated Langlaagte ..	£35,878	13·933	£28,526
Ginsberg	13,215	17·449	3,510
Glencairn	12,493	11·397	3,019
New Primrose	14,554	12·493	11,978
New Rietfontein	6,760	15·680	466
New Unified	9,059	13·470	5,203
Quest	2,254	10·461	571
Van Ryn Deep	32,488	15·386	38,123
Witwatersrand	28,347	12·338	25,668
August totals ...	£155,048	13·694	£117,064
July totals	£161,703	13·914	£118,604

Monthly gross profits: January, £87,277; February, £94,055; March, £104,704; April, £104,493; May, £110,139; June, £115,230; July, £118,604; August, £117,064.

Albu Group.

The following are the details of results regarding the August operations of the producing mines of the General Mining and Finance Corporation group:—

Company.	Stamps.	Tons Crushed.	Total Cost.
Aurora West	80	14,470	£13,954
Meyer and Charlton .	75	14,992	12,543
New Goch	120	31,600	20,461
Roodepoort United ...	75	34,000	27,005
Van Ryn	140	39,100	27,567
West Rand Consolidated ..	100	28,000	27,079
	590	£162,162	£128,609

Company.	Cost per Ton.	Total Revenue.	Profit.
Aurora West	19/ 3·4	£18,493	£4,539
Meyer and Charlton	16/ 8·8	32,783	20,240
New Goch	12/11·4	32,237	11,776
Roodepoort United	15/10·6	30,051	3,046
Van Ryn	14/ 1·2	50,407	22,840
West Rand Consolidated	19/ 4·1	34,462	7,383
		£198,433	£69,821

Consolidated Gold Fields Group.

The following are particulars in regard to the outputs and profits for the month of August of the undermentioned companies of the Consolidated Gold Fields group:—

Company.	No. of Stamps.	Tube Mills.	Tons Crushed.	Gold declared. Fine Ozs.	Total Profit.
Simmer and Jack ..	320	7	61,900	11,705	£23,851
Robinson Deep ...	110	8	15,000	11,593	20,011
Knights Deep ...	100	11	97,600	15,932	9,133
Simmer Deep ...	180	9	55,000	11,699	5,828
Sub Nigel . .	25	1	5,180	2,373	2,211
Totals .	1035	36	264,680	59,302	£61,337

The sundry revenue included in the above total declared profit is as under: Simmer and Jack, £1,800; Robinson Deep, £359; Knights Deep, £657; Simmer Deep, £375; Sub Nigel, £238; total, £3,429.

Reserve gold: Simmer and Jack, 500 ozs.; Robinson Deep, 1,260 ozs.; Simmer Deep, 1,832 ozs.; Sub Nigel, 580 ozs.; total, 4,172 ozs.

Neumann Group.

The following are particulars of the results achieved by the crushing companies of this group during last month, viz.:

	TONS.	YIELD.	PROFIT.
Witwatersrand Deep ...	13,140	£57,842	£21,179
Wolhuter	30,700	36,658	10,583
Consolidated Main Reef	25,066	38,365	12,843
Main Reef West ...	22,090	26,699	4,133
Knight Central ...	28,260	30,945	5,008
Total for group ..		£190,509	£53,746

Witwatersrand Deep.—Owing to an accident in the east shaft, hoisting was seriously curtailed, thus causing a reduction in the tonnage milled and an increase in the working costs.

Wolhuter Gold Mines.—The smaller profit and tonnage milled were due to a decrease in native labour and a temporary fall in value of a number of stope faces.

Robinson Group.

In August the Langlaagte Estate and G.M. Co. milled 51,950 tons, yielding 14,677 fine ozs. at an estimated profit of £16,574 6s. (4·56s. per ton milled). The Randfontein Central G.M. Co. milled 221,939 tons, yielding 60,552 fine ozs., at an estimated profit of £74,150 6s. (8·18s. per ton).

Goerz Group.

Results of operations of the crushing mines comprising the Goerz group for the month of August, 1914:—

Company	Stamps.	Tube Mills.	Tons Crushed.	Total Value of Output.	Total Profit.
May Consolidated ...	100	—	13,850	£9,903	£783
Princess Estate	60	5	22,600	29,201	2,323
Geduld Proprietary ..	55	5	23,010	38,702	10,480
	215	10	59,460	£77,806	£13,586

Brakpan Mines.

The following are particulars of the August operations of the Brakpan Mines: Stamps working, 140; running time, 30 days; ore crushed, 56,300 tons; tube mills working, 9; ore hoisted, 63,721 tons; waste sorted, 14·11 per cent.; fine gold declared, 18,235·854 ozs.; value declared, £76,788, equal to 27s. 3d. per ton milled; working costs, £49,003, equal to 17s. 5d. per ton milled; working profit, £27,785, equal to 9s. 10d. per ton milled.

Wolhuter Gold Mines.

At the Wolhuter, in the three months ended July 31, the amount of tons developed or exposed (including ore mined from development) was 107,092 tons; assay value 6·90 dwts. over 64·8 inches. The payable ore reserves at that date were:—752,859 tons, valued at 6·23 dwts., over 53 inches.

Mashonaland Agency.

Although conditions in the Rhodesian market remained depressed throughout the past year the Mashonaland Agency did rather better than during the previous twelvemonth. The directors' report shows that a gross profit was made of just over £10,000, against £5,500 during 1912. Moreover, this time only £3,400 is written off for depreciation, as compared with £17,000 a year ago. The balance at credit of profit and loss account is, therefore, raised by £6,600 to £18,280, instead of being reduced. Once again, however, the shareholders have to go empty away, their last dividend having been one of 6d. per share for 1911. It is significant of the recent neglect of Rhodesians that whereas the directors on a comparatively conservative basis estimate the assets of the Company at equivalent to the par value of the shares, the latter stand in the market at only about one-third that level. Indeed, the present price of the shares is represented fully by the market value of the quoted shares, debentures, etc., held by the Agency, leaving entirely out of account the unquoted holdings, mining claims, agricultural land and cash at bankers, bullion in transit and debtors, less creditors.

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Base Metal Mines and the War.

A London correspondent writes:—As regards base-metal properties, a number of copper and tin mining propositions are faced with a serious position, but we have not heard of any more closing down, though, undoubtedly, a number are curtailing operations. Several of the Broken Hill silver lead zinc mines are only running half time—the South Mine, which announced last week that it was shut down, has since been able to resume part of its operations—but, with Government assistance and assuming the success of arrangements which are being made for smelting the concentrates elsewhere than in Germany, production is likely shortly to be again on something like normal lines. While copper is something like a drug in the market in the United States, both lead and zinc have been in good demand here for military purposes. Tin, owing to the stoppage of the usually large imports into America, has been the subject of a "bear squeeze" in New York, and has been quoted there at the equivalent of £300 per ton or well over double the last officially marked price here. In Cornwall, however, the mines have been unable to get the smelters so far to quote a reasonable price for their product; while, as regards Nigeria, the Government commandeering of the railways will, it is feared, interrupt shipments of the concentrates, even if only temporarily.

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Concerning Capital.

Statistics collected by the Mines Department show that the nominal capital of the gold mines in the Rand area was £62,504,170, and the dividends earned during 1913 amounted to £8,215,201. The capital of mines outside the Rand area was £9,223,131 and the dividends earned in 1913 amounted to £391,333. The total number of gold mines is 174, the total capital £71,727,301, and the total dividends earned in 1913 amounted to £8,606,534. There are 13 diamond mines, the nominal capital of which amounts to £646,012, and the dividends declared during 1913 were £400,000. The coal mines number 29, the total nominal capital being £4,865,250, and the dividends earned £265,212. The base mineral mines number 29, with a total capital of £1,847,117, which earned £96,000 in dividends.

Native Labour Returns.

The following is the disposition of natives employed at the last day of August by the W.N.L.A. and contractors:—

On gold mines	168,831
On coal mines	9,485
On diamond mines	—
Total	178,316

At the last meeting of the Chemical, Metallurgical and Mining Society, the President said:—"In the last list of Birthday Honours two of our honorary members—Mr. R. A. S. Redmayne and Dr. T. K. Rose—received the honour of Knighthood. Dr. Rose (who is the Chief Assayer of the Royal Mint) in particular, has been extremely kind to many of our members visiting England. He has done all in his power to make their visit enjoyable and to assist them in every way during their visits, and, further, he has taken a great deal of trouble in seeing that the medals which the Society has presented at various times have been satisfactorily executed in England. I propose, therefore, that a very hearty vote of congratulation be passed to Sir T. Kirke Rose and Sir R. A. S. Redmayne." This was agreed to unanimously.

THE YEAR WITH SWAZILAND TIN.

Increased Amount of Ground Treated—Lower Grade—Reduced Profits Owing to Fall in Price of Metal.

The working profit of Swaziland Tin, Ltd., for the year ended June 30, 1914, amounted to £8,400 3s. 4d. After allowing for sundry items of expenditure and revenue, a net profit of £7,136 0s. 11d. is carried to Appropriation Account. To this has to be added the amount unappropriated at the end of the previous financial year, £6,162 6s. 2d., making a total of £13,298 7s. 1d., which has been dealt with as follows:—Expenditure on property and equipment, £3,527 11s. 1d.; dividend No. 14 of 5 per cent., declared 24th December, 1913, £4,100; balance carried forward, £5,670 16s. The working expenditure and revenue account for the year was as follows:—Revenue: 379·809 tons of tin concentrates shipped, £39,725 15s. 3d. Expenditure: As per particulars set out in the accounts, £31,325 11s. 11d.; working profit, £8,400 3s. 4d. The shipments for the months of March, April, May and June have been taken into the accounts at the price of tin as at 30th June, 1914, viz., £137 15s. per ton. The amount of £734 15s. 6d. paid in connection with the Zaaiplaats Lease represents the company's proportion of the amount spent upon development work which has been carried on during the year. No return was received from this venture during the year, as the ore produced had not been milled. The net capital expenditure during the year amounted to £3,527 11s. 1d. The directors, in the course of their report, state:—"It will be seen that there has been a considerable increase in the amount of ground treated but that same has been of lower grade. The serious decline in the price of tin is chiefly responsible for a decreased profit. Your directors regret that they were, therefore, unable to declare a dividend during the latter half of the financial year."

Consulting Engineer's Report.

The Consulting Engineer, Mr. J. Jervis Garrard, writes:—"The working profit for the year was £8,400, as against £24,729 for the previous year, the decrease being due to the severe drop in the price of the metal and to the lower grade of gravel treated during the year. A comparison of the year's results with those of the previous year is as follows:—

	1913-14.	1912-13.
Cubic yards treated during year ..	722,014	408,349
Cubic yards treated, average per month ..	60,168	34,029
Lb. concentrate recovered per cubic yard	1·178	1·833
Grade concentrate per cent. metallic tin	71·9	71·7
Lb. metallic tin per cubic yard	0·847	1·314
Average value per cubic yard	1s. 0·584d.	2s. 2·214d.
Average cost per cubic yard	9·792d.	11·681d.
Average profit per cubic yard	2·792d.	1s. 2·533d.

These figures show that the amount of ground treated during the year was 76 per cent. more than during the previous year and the cost of working per cubic yard 16·2 per cent. less; but, as the price realised was 25·5 per cent. less and the grade of ground per cubic yard 35·5 per cent. less than during the previous year, the profit was greatly reduced. They also indicate that it would have been much more difficult to have carried on profitable work during the past year if it had not been for the installation of the electrically-driven gravel pumps, which enabled so much more ground to be treated at a lower cost. It will, however, be seen from the figures given later that the ground worked during the year is below the estimated average grade of the reserves so far proved by drilling. This is due to the adoption of the correct policy of working straight ahead, as far as possible, and taking the bad ground with the good (as long as the former is not unprofitable). Considerable improvement was made in the latter months of the year in the working of the gravel pumps as the staff became better acquainted with this method of working. Both the percentage of running time and the amount of ground treated per hour were increased, and as the grade of ground immediately ahead of the machines, according to the boreholes, is better than that recently worked, it is to be expected that both the amount of ground treated and the quantity of concentrate produced will be capable of considerable increase during the coming year, provided the price of metal warrants working at full capacity. At the same time considerable economies in the cost of working are being introduced. The average amount of ground elevated by each gravel pump, including all delays in shifting sites, etc., was 11,000 cubic yards per month, the maximum being 19,100 cubic yards in one month. It must be remembered that the greater part of the ground recently and at present being worked, is ground which had been partially worked by hand in former years, and consequently it consists of the coarser gravel from which most of the fine sand and earthy matter has been removed, and which is therefore much more difficult to deal with. Two machines, however, will shortly be working in virgin ground. During the dry season it is proposed to run the pressure nozzle pump from Gray's Creek in conjunction with one of the gravel pumps at Mbabane Flat, and so set free all the water from the Mbuluzi River for the two gravel pumps at King's Flat, by which means it is hoped to keep all three gravel pumps working even through the dry season. A hydraulic elevater has been in use throughout the year at Stable Creek, taking on the average 1,177 cubic feet of water for each cubic yard of ground broken and elevated to a height of 30 feet. Of this water an average of 371 cubic feet was required per cubic yard of ground broken down, by monitors under 45 lbs. pressure, so that the elevator consumed 68·5 per cent. of the available water for its own operation, leaving only 31·5 per cent. available for breaking ground. As, however, the Creek is comparatively narrow where work has been and will be carried out for some time, there is only room for one elevator, and the water supply is amply sufficient for this, as this creek is worked with the same water that has been already twice used for breaking ground in the upper workings and once for generating electric power. The comparative efficiency of the 12 inch hydraulic elevator lifting 30 feet as against the three 8-inch gravel pumps lifting 40 feet on the actual year's running, works out as follows:—Hydraulic elevator, 15·2 per cent. Average of three gravel pumps, 24·3 per cent. (the efficiency basis being equivalent to the total foot lbs. of water and solids lifted to the required height divided by the foot-lbs. consumed either in water or electrical units to do the required work; but allowing 35 per cent. for losses in the latter case for electrical transformation and transmission). This means that the gravel pumps actually did 60 per cent. more work than the hydraulic elevator for a given quantity of water power, whilst, of course, the same water (which formerly ran to waste) after generating power for the gravel pumps is used in breaking and elevating ground at Stable Creek. The following statement shows the position of ore reserves, as proved by drilling, at 30th June, 1914:—

	Stable Creek.	Mbabane Flats.	King's Flats.	Ntamban.	Total.
Original estimate, cubic yards	143,433	1,591,027	233,591	—	1,958,051
Original estimate, lb. M.T. per cubic yard	1·61	1·51	1·67	-	1·53
New ground proved by drilling, cubic yards	165,739	112,464	—	19,583	297,786
New ground proved, lb. M.T. per cubic yard . ..	1·42	·43	—	·58	·99
Ground cut during year, cubic yards	168,788	*87,813	*32,000	--	*288,591
Ground cut during year, lb. M.T. per cubic yard	1·05	·70	·65	--	·95
Excess yardage cut above original estimate, cu. yds.	45,554	31,049	12,417	—	89,020
Total estimated reserve as at 30th June, 1914, cubic yards	185,948	1,646,727	204,008	19,583	2,056,265
Total estimated reserve as at 30th June, 1914, lb. M.T. per cubic yard	1·30	1·46	1·73	·58	1·47

*These figures represent the amount by which the estimated reserves were depleted, the actual amount of ground cut at these workings being, as shown in the manager's report, much more; but the balance was ground which had not been taken into account.

This makes a total of 2,056,266 cubic yards of profitable ground proved by boreholes ahead of present workings, showing an average value of 1·47 lbs. of metallic tin per cubic yard. The estimate given in my last annual report of 10,000,000 cubic yards of tin bearing ground in addition to that already proved still holds good. Further prospecting by means of drilling was stopped during the year for reasons of economy, but it is proposed to continue this important work as soon as possible.

Glynn's Lydenburg.

The following are particulars of the output of the Glynn's Lydenburg for August:—Tons crushed, 1,111, yielding 1,870 fine ozs.; estimated value of month's output, £7,841; estimated profit for month, £3,966.

Zaaiplaats Tin.

The results of the Zaaiplaats Tin Mining Company for the month of July are as follows: Days run, 30; ore milled, 2,670 short tons; residue re-treated, 1,006 short tons; concentrates won, 90 long tons; average value of concentrates, 68.1 per cent. M.T. Owing to the closing of the metal market only 48 tons of concentrates were sold for the month, and realised an average of £144 per ton metal. In view of the position of affairs in Europe the directors have decided to reduce milling operations and to carry on only important development work in order to conserve the company's cash resources as long as possible. Satisfactory arrangements are being made to retain the European employees on the property.

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Rhodesian Section.

LATEST MINING NEWS.

The Falcon—Pickstone Gold Mines—B.S.A. Company and Bulawayo—King's Asbestos.

THE Falcon is said to be getting down into its stride and that output declarations will shortly be made. Certain slight additions and alterations have yet to be made, but no serious difficulty either mechanical or metallurgical has yet been encountered. The average values of the ore already crushed fully corroborates the mine assay plan, so that shareholders may feel easy in their minds, despite the doubts which were some months ago cast upon it in certain quarters.

* * * *

The Pickstone manager's report for July states that no development work was done during the month. The gold was worth £3,813, while expenditure on capital account was £7 15s. "The expenses for the month amounted to £2,668 11s., leaving a profit of £1,145 1s. 6d. This, however, does not take into account depreciation on plant and machinery."

* * * *

A deputation, consisting of representatives of the Bulawayo Town Council, the Chamber of Mines, the Chamber of Commerce, and the Rhodesia Farmers' and Landowners' Association, and members of the Legislative Council, waited upon the directors of the B.S.A. Company recently in regard to the rumoured removal of the commercial offices of the Company from Bulawayo. A report of the proceedings will appear later. In the meantime, it may be stated that the Mayor has received a communication from the Secretary of the B.S.A. Company intimating that following the interview in question the visiting directors have heard from the board of directors by cable "that the policy of the Company so far as the continuation of the commercial representatives' headquarters at Bulawayo is concerned is that no change is contemplated at present, and that the future policy must be dictated by the outcome of the developments of the future in view of the best interests of the country as a whole and of the Company's commercial undertakings, in which the prosperity of Rhodesia is so largely concerned."

* * * *

We are requested to publish the following information regarding the King Asbestos (Rhodesia), Ltd.:—The directors have resolved to exercise their option to purchase the 165 asbestos claims and the 235 chrome claims, and transfer of this property is now proceeding. The terms of purchase have been reduced from £105,000 in cash and shares to £98,000 in cash and shares, thus increasing the working capital of the company from £20,000 to £27,000. The directors have agreed to extend the period for payment of the final call of 8s. per share, which fell due on the 31st August, 1914, as follows: 30th September, 1914, 2s. per share; 31st October, 1914, 2s. per share; 30th November, 1914, 2s. per share; 31st December, 1914, 2s. per share, with interest added reckoned at the rate of 5 per cent. per annum from the 31st August, 1914, to date of final payment, such interest to be payable with the last instalment. The consulting engineer reports under date 27th ult. as follow: Eastern workings show shorter fibre than in the past. This is due to the longer seams being gouged out in every direction in anticipation of the property being taken over by the company. The western quarries expose fine faces, showing long fibre. A new quarry on this section of the property is now 40 feet long by 10 feet deep and shows exceptionally fine fibre. Systematic benching of the area is being started immediately, and faces will be opened so that production on a large scale can begin at any time the fibre market warrants it. The chrome iron claims are also to be thoroughly prospected immediately, and all ore discovered will be stripped and trenched. Provision is being made for a permanent water supply for the property. The erection of substantial brick houses for the European employees and compound to accommodate four hundred natives is receiving the consideration of the board.

S.A. Option Syndicate.

The ordinary general meeting of the South African Option Syndicate, Ltd., was held in London recently. Sir John C. Willoughby, Bart., presided, and, in moving the adoption of the report for 1913, said the accounts submitted for consideration differed very slightly from those of the previous year, very little prospecting work having been carried on by the syndicate during the year under review. Down to the end of June prospecting work on the Wessels area was continued, in accordance with the advice of Mr. Minett Frames, and diamondiferous ground was met with, but it was of so patchy a character that it was deemed advisable to discontinue work on this area. Also on the Colossus area a test washing was made of yellow and blue ground, and a small number of diamonds were recovered, but not of sufficient value to warrant further work. On the Somabula area the prospects of finding a payable pipe were much more encouraging. As he explained last year, it had been proved that diamonds existed below what was originally considered to be bedrock, and they were given to understand that the tributor who was now engaged on this exploratory work was decidedly hopeful of results. Naturally, the progress was rather slow, but the continued finding of payable diamonds on this area was a hopeful sign, and they trusted that ultimately they might have the good news that payable ground had been met with in depth. The numerous diggers on this area continued to meet with a fair amount of success. During last year 700 carats of diamonds were recovered of a value of about £3,600, and, so far this year, a further 480 carats had been won of a value of £1,780. The board fully believed they were justified in entertaining hopes that sooner or later one of the sources of these diamonds would be found.

The report of the South African Option Syndicate, Ltd., for 1913, presented at the recent meeting, states that a small amount of work was done during the year on the Wessels and Colossus areas, but no payable ground being met with, further prospecting has been discontinued. Sales of machinery and plant are being made as opportunity offers. At the end of the year there were about 30 licensed diggers at Somabula. During the year the finds registered amounted to 699⅜ carats of diamonds of an estimated value of £3.586, the largest stone weighing 36¼ carats and realising £543 15s. For the first five months of the present year the recovery of 483⅜ carats has been registered of an estimated value of £1.783. As reported last year, work is being energetically continued by individual diggers on one portion of the Somabula area in the hope of finding payable diamond ground in depth. In addition to its diamond rights the syndicate owns a one-third interest in 10.000 acres of land adjacent to the railway, and upon which is situated the Wessels diamond area. The company holds 75,371 fully-paid shares of 5s. each in the Connemara Mining Company. This mine has ore reserves amounting to 300.000 tons, of an estimated value of £450.000. Mr. Ackermann, the consulting engineer, recommends the erection of a plant to treat from 5.000 to 6.000 tons a month, and the provision of the necessary funds required for the purpose is now under consideration.

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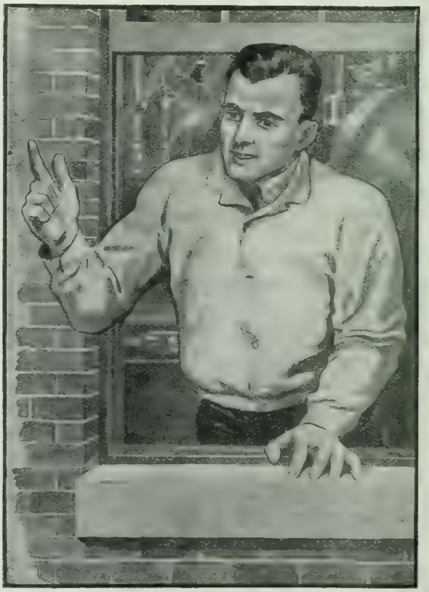

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Engineering Notes and News.

War Service for Electrical Engineers.

The Council of the Institution of Electrical Engineers in England has issued a circular to the members pointing out that there are two important directions in which they may be of great service to the nation at the present time:—First: To place their services as electrical engineers at the disposal of the War Office and the Admiralty. Secondly: To be in readiness to fill vacancies in public services, electric power stations, tramways, railways, etc., caused by the calling up of the Reserves and Territorial Forces. With the view of being ready to assist the authorities and the public services, the Council has decided to prepare classified lists of suitable men, and for this purpose has asked members who are in a position to assist in any of the directions indicated, to fill in and return a form giving full particulars of the occupations for which they are fitted. It is assumed that the rates of pay would be the current rates for the services rendered.

Tube Mill Ends.[*]

[By. J. F. PYLES.]

On mines where worn-out Osborn liner bars are carefully conserved for reinforcing other types of tube-mill liners, the following description of a wood and steel end liner may prove of interest: The liner is built round a casting or sleeve, which should be 1½ inches thick. The annular outer portion is built of 6 inch chert blocks, the remaining space being filled with alternate layers of scrap steel cut to 6-inch lengths and 1 inch pine boards. The procedure in building the liner is as follows: First place the casting or sleeve in position, then build in the outer layer of chert blocks, which have been previously shaped to fit the mill. These blocks are placed in the mill with Portland or magnesite cement and keyed in position. A layer of 6 inch pegs is then put in with their axes parallel to the sleeve and their sides touching each other, and embedded in mortar. Next a board 1 inch thick and 6 inches wide, touching the chert circle at each end, is laid on the pegs and tapped at each end. Mortar is placed on this board and the next row of pegs embedded in it, and so on until the liner is completed. The work of building this end liner will occupy one mason for half a day. The end has the following points to recommend it: It is inexpensive, both as to material and labour, and is quickly and easily installed. Owing to the wood absorbing the moisture from the cement, the end dries in a much shorter time than if only steel or chert were used. The swelling of the wood wedges the whole so tightly that all danger of the end, or any part of it, coming out is obviated. The life of the outlet end will be materially increased by staggering the wood and iron. This may be done by cutting the 1 inch board into pieces 6 inches square. Each row is then made by alternating 6 inches of steel with a 6-inch piece, and arranging the rows so that each piece rests on and is covered by steel. The pieces are placed with the grain of the wood parallel to the pegs. The writer does not claim that the idea of using wood and steel for tube-mill liners is in itself original, but, to the best of his knowledge, its practical utility has not been proved previously with regard to tube-mill end liners. The adoption of this end liner was suggested, firstly, by the necessity of installing one that would not fall out, and, secondly, by the importance of economising steel.

Electrical Exports from Germany.

The electrical manufacturing industry of Germany occupies the first position from the standpoint of the few industries in that country which have scarcely been detrimentally affected by the generally unfavourable reaction in trade during the past twelve months. This fact is illustrated by the value of the exports in the first half of the present year as compared with the equivalent periods in the preceding years. The figures are as follows, marks being assumed to be equal to shillings:—Value of electrical exports: First half of 1910, £5,077,000; first half of 1911, £4,899,000; first half of 1912, £5,119,000; first half of 1913, £6,238,000; first half of 1914, £7,311,000. As compared with the first half of 1913, the exports in the six months of this year show an increase of 18 per cent., whilst the advance as contrasted with the first half of 1912 is 44 per cent. The principal position of the augmentation applies to material for lighting and power installations, the value of which rose from £1,261,000 in the first half of 1913 to £2,128,000 in that of 1914. The chief customer was Russia, which imported material of twice the weight as compared with the period of 1913. In the case of dynamos of over 10 cwt. in weight, the exports advanced from a value of £749,000 in 1913 to £867,000 this year, Italy being the best customer. The exports of metal-filament lamps rose from 19,540,000 to 20,000,000 lamps, but the cheaper prices prevailing caused the value to decline from £980,000 to £961,000. On the other hand, the number of carbon-filament lamps receded from 4,210,000 to 2,580,000, of which Russia imported about one-fourth The only large reduction took place in cables, which decreased from £913,000 in the first half of 1913 to £845,000 in the corresponding period of the current year.

Transvaal G M. Estates

The following are particulars of the outputs of the mines of the Transvaal Gold Mining Estates for August:—Central Mines: Tons crushed, 12,700, yielding 7,699·188 fine ozs. Elandsdrift Mine: Tons crushed, 690, yielding 776·845 fine ozs. Vaalhoek Mine: Tons crushed, 1,500, yielding 630·212 fine ozs. Estimated value of output, £38,213; estimated profit for month, £21,254.

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[*] From the Journal of the Chemical, Metallurgical and Mining Society.

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NOTES ON TRANSFORMERS.*

Experiences of the Two Rand Power Companies.

[By Mr. BERNARD PRICE, Vice-President of the S.A.I.E.]

Mr. Dinham-Peren in his paper deals in a general way with a number of important questions concerning the choice and use of transformers, and I should like to refer to the experience obtained on the systems of the two power companies operating in this district in regard to some of the points raised.

THREE PHASE vs. SINGLE-PHASE TRANSFORMERS.

I agree with the general conclusion arrived at by the author. The local system is typically one dealing with a relatively small number of relatively large consumers, and as a result the average capacity per sub-station is high. It is, of course, essential to adopt the self-oil-cooled type for sub-station use, as cooling water is not readily available, and although by special design this type can now be made in sizes up to 1,500 K.V.A. or even more, the 1,000 K.V.A. was the largest size that had been generally standardised at the date when the scheme was developed. As the average capacity per sub-station amounts to several thousand K.V.A. the cost of the transformers themselves will be no more for three-phase than for single-phase, even if the switchgear and connections were arranged so that any one of the single-phase transformers might act as spare to all the others. When cost of buildings and switchgear are included the three phase is the cheaper type, and it certainly is the more convenient from the operating point of view. Whilst it is true that the single-phase type on account of its reduced size and weight facilities handling and transport, no real difficulty arises in transporting and handling three-phase transformers in this district up to 1,000 K.V.A. size or even higher. The comparison is different when considering very large transformers. The local system has now a morning load of over 125,000 K.V.A. The whole of the power passes through step-up transformers before being dealt with on the switchboard, and a large portion is again transformed down before reaching the sub-stations. Such conditions call for very large units, and here the single-phase transformer is at some advantage. Although the total cost, including spare, with buildings, etc., may not be very different in the two alternatives, the ease in handling and in affecting repairs becomes matters of real importance. As a mater of fact the largest three-phase units on the system are of 12,500 K.V.A. capacity, and it was only when equipping 15,000 and 18,000 K.V.A. generators that we departed from the three-phase type. Personally, however, I would prefer to place the limit for a three-phase transformer at less than 12,000 K.V.A. for reasons of convenience in operation and maintenance. The advantage which the single-phase type has of enabling two units to operate at reduced load when the third is out of commission is of greater force when considering generator transformers, because it is not convenient to arrange the generator switchgear so that the spare three-phase transformer can be immediately available for use on any of the generators. It would be very expensive and very complicated to provide switchgear at the generating pressure for the purpose of paralleling the various generator transformers in the station. Each generator transformer must, therefore, be directly connected to its own generator, and if a single three-phase transformer is used for each generator the failure of any one such transformer means the loss of the generating unit to which it is connected for the period of time taken to remove the faulty transformer and replace it by a spare.

CORE TYPE vs. SHELL TYPE.

We have had considerable experience with both these types of transformer, and although a good job can, no doubt, be made of either type, the shell type has, on the whole proved the more satisfactory in our case.

CLAMPING OF WINDINGS.

In my opinion the shell type lends itself more readily to the introduction of heavy clamping arrangements than does the core type, and I have found that the shell type can, without undue expense or complication, be made to withstand the most severe conditions obtainable on even the largest system. With the core type the problem is not a very difficult one for large transformers, but for transformers of 1,000 K.V.A. capacity and less it is not easy to avoid a relatively important increase in initial cost. In my experience the standard designs for this latter type often do not meet requirements under extreme conditions. I have no wish to condemn the core type, which I consider has certain advantages of its own, but particular care is necessary in the design to avoid displacement of the coils under short circuit conditions, and it would appear that this type is placed at some disadvantage in first cost when adequately designed in the smaller sizes. I have no doubt that the various standard designs at present on the market have proved quite satisfactory on the majority of schemes, where the maximum available power is not very large, but these same designs have proved inadequate on very large systems and especially where, as in this district, the distances to sub-stations are relatively short and the voltages are relatively high. It is not safe for the designer to assume that the impedance of the system through which his transformer will be fed rises in proportion to the pressure adopted on the primary side. It is often necessary to select a relatively high pressure in order to enable large quantities of power to be distributed over relatively short distances at minimum capital cost. The distribution pressure of 20,000 volts adopted in this district was chosen on this account, although the average length of feeder from generating station to usb-station is only a few miles, and the maximum distance does not exceed nine or ten miles. Had a lower pressure been chosen the cost of lines and switchgear would have been largely increased. Under such conditions the windings of all apparatus connected in series with the main circuits, including generators, transformers and current transformers, must be very securely supported.

CIRCULATION OF OIL

The shell type of transformer is usually placed with its coils vertically, whereas the core type has its coils placed horizontally. As is only to be expected, experience shows that the circulation of the oil is more rapid and more effective with vertical coils. If there is any tendency towards sludging of the oil it will be found that whereas with horizontal coils a deposit is readily formed on the flat surfaces of the windings, the vertical coils are scoured and remain clean, provided, of course, that the sludging is not very severe. No doubt it is fair to say that sludging should not be allowed to take place, but from the standpoint of the operating engineer some advantage can be claimed if a defect in one direction does not rapidly produce serious trouble in another.

SLUDGING OF OIL.

The deposit of sediment from sludging oil is a most serious trouble if it once sets in, because the effects are cumulative. The sludging itself is largely dependent on the temperature of the surfaces with which the oil is in contact, and the deposit resulting therefrom at once increases this temperature. Moreover, this increase in temperature is local to the parts affected and does not raise the temperature of the mass of the oil in anything like the same proportion. A transformer may, therefore, be ruined before the operating staff have reason to suspect serious trouble. Unless it is caught in good time the deposit on the coils will cause hot spots in the windings and the sediment under the influence of the increased heat will cake. The insulation of the windings will char, and even if the trouble is discovered before this stage is reached the

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*Read before the South African Institution of Engineers.

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cleaning of the transformer becomes an expensive and tedious business. Without attempting to enter into a full discussion of the precautions to be taken when selecting the class of coil to be used, I would like to record another point brought out by experience here regarding the influence of operating conditions upon this sludging question. The transformers in use may be divided into two classes, namely, those which have an air space at the top of the tank above the surface of the oil and those in which the case is entirely full of oil, and which are provided with a relief pipe and auxiliary tank for taking up the increase and decrease in the volume due to change in temperature. In the latter case the oil which circulates and becomes heated cannot reach the air, whereas in the former the hot oil at the top of the tank is always in contact with air. Our experience is conclusively in favour of the exclusion of all air from the transformer tank, and we have every reason to believe that sludging of oil can be entirely prevented with such an arrangement, provided the oil in use is of a carefully-selected type, and provided the temperature of the oil is not allowed to exceed the limits fixed in standard specifications to-day. Experience on this subject is only acquired gradually, and it is as yet too early to say how far, with such an arrangement, it would be safe to go in the direction of selecting a cheaper oil or of increasing the temperature. There is, however, no doubt as to the efficacy of eliminating all oxygen from contact with the hot oil. This is a point which should also be borne in mind when selecting the method for drying out oil. Another factor which undoubtedly assists the oil to sludge is the presence of suspended particles of dust in the oil. The oil-tight transformer case with small expansion tank can readily be rendered entirely dust-proof. The joints of the covers of transformers having an air space above the oil should be most carefully packed to prevent breathing through the joint, and a suitably designed filter should be attached to the cover of such transformers so that the variation in the volume of air in the tank may take place through it. The dust is a nuisance in any case, as its presence in the oil seems to facilitate the precipitation of the sludge. This point may be of little moment in some localities, but it is quite an important one in this district.

(To be continued.)

Finance, Commerce, and Industries.

Tin Prices and the Canning Industry.

Tin has risen to a high price in New York, the latest American quotation being equivalent to about £300 per ton, whereas the last cash price quoted on the London Metal Exchange, on the eve of the August vacation, was £132 5s. per ton. Presumably the big rise represented by the American quotation is due to a shortage of supplies, and we believe it has already been suggested that certain tin producing companies should endeavour to ship their concentrates to the United States. They would, however, need to be smelted before the metal could be supplied to the tin plate mills, and, so far as we are aware, there are no tin smelters in America at present. Unless some of the American smelters decide to devote a part of their equipment to the treatment of tin concentrates, the latter must apparently still be shipped to England to be smelted, and the question of the supply of metal for tin plates, which are, of course, used in the manufacture of tin cans to contain foods of various kinds—now in greater demand than ever—will depend upon the regular supply of concentrates to the smelters and their ability to continue smelting operations.

* * * *

Income Tax Regulations.

The regulations framed under the Income Tax Act have been published in the *Government Gazette*. Returns are required from all persons and companies whose income arisen or accrued from sources within the Union during the twelve months ended the 30th of June, 1914, exceeded £1,000. In regard to insurance companies the profits, dividends, or interest from investments shall be separately ascertained in respect to the following branches: (1) Life, (2) annuity, (3) fire, (4) accident, including employer's liability, (5) marine, (6) fidelity or guarantee. Every non-mutual insurance company shall be liable to be assessed on the amount of its actual profits, ascertained as follows:—(a) In regard to life insurance: By taking a proportion of the total life profits of the company in the same ratio that the premiums received in the Union during the year of assessment bear to the total premiums received. (b) In regard to annuities: By taking a proportion of the total annuity profits of the company in the same ratio that the annual payments by the company in the Union in respect of annuities during the year of assessment bears to the total annual payments by the company in respect of all its annuities. (c) In regard to any other branch of insurance business: By charging against the premiums received—less any premiums on re-insurances effected in the Union—and other incomes derived or received in the Union, the actual losses—after deduction of reinsurances effected in the Union—and expenses incurred in the Union in respect of such premiums and income, provided that no amount set aside for unearned premiums shall be allowed in arriving at the amount so ascertained.

* * * *

Paper-making in South Africa.

From the Department of Agriculture we learn that the idea of utilising "tambuti" (or "Tambookie") grass (Cympopogon validus) which grows in such profusion in Natal, the low veld of the Transvaal, and other parts of the Union, for the purpose of paper-making, is no new one. The possibilities of the question have often been speculated upon, but nothing definite has hitherto been arrived at. A sample of tambuti grass was recently submitted by the Department of Customs and Excise to the Imperial Institute, and the report, which has just been received, is distinctly encouraging. The sample of grass weighed 12 lbs. and consisted of lengths up to about 5 ft. 6 in., the stems measured about ⅛th inch in diameter at the base. A chemical examination of the grass gave the following results, and the corresponding

OIL AND THE NAVY.

As a result of extended and exhaustive trials, aimed at a maximum of efficiency under all conditions, the Government contract for the supply of **ALL** Lubricating Oils for the entire Fleet of the United States Navy has been awarded to **THE TEXAS COMPANY,** who have also secured for the fourth year in succession, the Navy Fuel Oil Contract.

These results were achieved in the teeth of the keenest competition in the World, and therefore bear eloquent testimony to the quality of **TEXACO PRODUCTS.**

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figures for Algerian esparto grass (which is at present largely used in paper-making) are included for the purpose of comparison:—

	Tambuti Grass. %	Esparto Grass. %
Moisture (on drying at 100° -110° C.)	10·2	8·8
Ash (expressed on dry material) ...	7·4	3·0
Yield of unbleached pulp (dried at 100°-110° C.):—		
(1) Expressed on material air dry material	37·1	29·5
(2) Expressed on material dried at 100°-110° C.	41·3	32·3
Loss on weight of pulp on bleaching	3·1	1·3
Yield of bleached pulp (dried at 100°-110° C.) expressed on original material dried at 100°-110° C. ..	40·0	32·0
	Inches.	Inches.
Length of ultimate fibres	0·012 to 0·188 0·081	0·012 to 0·12 0·045

The report says that, on heating with caustic soda solution under pressure, the tambuti grass was readily converted into a light fawn-coloured pulp, which was very easily bleached to a pure white product. It will be noticed that the yield of pulp is unusually high, whilst the average length of the ultimate fibres is considerably greater than in the case of esparto grass. Paper-making trials carried out at the Imperial Institute showed that a satisfactory paper of fairly good strength could be prepared from the tambuti pulp, and specimens of both the bleached and unbleached product have been received by the Department of Customs and Excise. The report concludes: , " The high yield of pulp of good quality, and the ease with which the pulp is bleached, show that the tambuti grass is well adapted for paper-making, and the crude material would probably be worth about £4 per ton in the United Kingdom. It would, however, probably be more remunerative to convert the grass into ' half-stuff ' in South Africa, and either ship this ' half-stuff ' to Europe or utilise it locally for the manufacture of paper."

* * * *

Government's Maize Planting Scheme.

The Department of White Labour has been advised by the Department of Lands that about eighty men will be taken on in connection with the mealie planting scheme at Modderfontein. Applications will be received at the White Labour Department's offices, where a list of conditions may be seen. One of the officers of the Lands Department will come over to Johannesburg and deal with the applications.

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East Rand Proprietary Mines.

Following is the text of a cablegram despatched to the London office of this company on the 5th instant:—" The following are the results of last month's operations: 820 stamps milled 172,350 tons; 56,592 ozs. fine gold recovered, valued at £237,746; including 1,285 ozs., valued at £5,395 recovered from the treatment of the accumulated slimes. Profit for the month, £80,448; including £4,115 profit from treatment of the accumulated slime."

FERREIRA DEEP, LIMITED.

(INCORPORATED IN THE TRANSVAAL.)

DECLARATION OF DIVIDEND No. 23.

NOTICE is hereby given that an Interim Dividend of Twenty-five per cent. (Five shillings per share) has been declared by the Board for the half-year ending 30th September, 1914.

This Dividend will be payable to Shareholders (other than German or Austrian subjects) registered in the Books of the Company at the close of business on 30th September, 1914, and to holders (other than German or Austrian subjects) of Coupon No. 23 attached to Share Warrants.

The Transfer Books of the Company will be closed from the 1st to the 7th October, 1914, both days inclusive.

The Dividend will be payable to South African Registered Shareholders (other than German or Austrian subjects) from the Head Office, Johannesburg, and to European Shareholders (other than German or Austrian subjects) from the London Office, 1, London Wall Buildings, London Wall, E.C., on or about the 4th November, 1914.

Holders of Share Warrants (other than German or Austrian subjects) are informed that they will receive payment of the Dividend on presentation of Coupon No. 23 at the London Office of the Company, or at the Credit Mobilier Francais, 30 and 32, Rue Taitbout, Paris.

Coupons must be left four clear days for examination, and will be payable at any time on or after the 4th November, 1914.

By order of the Board,
RAND MINES, LIMITED,
Secretaries,
per E. CALVERT,
Asst. Secretary.

Head Office,
The Corner House,
Johannesburg,
8th September, 1914.

THE SOUTH AFRICAN
Mining Journal,

WITH WHICH IS INCORPORATED

South African Mines, Commerce and Industries.

ESTABLISHED 1891.

VOL. XXIV., PART I.] SEPTEMBER 19, 1914. [No. 1199.

HEAD OFFICE: 176-180, Stock Exchange Buildings, Fox Street (2nd Floor), Johannesburg, Union of South Africa.

Telephone **913.** P.O. Boxes **963** and **418.**

Cable and Telegraphic Address: **"MINING JOURNAL."**

AGENTS FOR GREAT BRITAIN: Argus Printing and Publishing Co., Ltd., Byron House, 82-85, Fleet Street, London, E.C.

AMERICA: Advertisements accepted from any recognised Advertisement Agency.

ANNUAL SUBSCRIPTION RATES: Oversea, £2; South Africa (by post), £1 10s.; Local Delivery (Town only), £1 6s.

Copies of this journal are obtainable at all Branches and Agencies of the Central News Agency, Ltd., at all News Agents and Railway Bookstalls throughout South Africa, and at the London Agency as above.

NOTICE.—The postage of this issue of the *S.A. Mining Journal* is: South Africa, ½d. All other parts, 1d.

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Notes and News.

The Coming Municipal Elections. Disdaining to follow the good example of Great Britain—which has postponed for a year all municipal elections—the Union and Provincial Governments have committed us to the holding of a municipal election in Johannesburg next month. An important movement is therefore afoot, promoted by all sections of the community, irrespective of party, to secure the return of the best men. An influential committee has been formed, and an appeal is being issued to all public-spirited citizens to unite in the cause of clean, sound Municipal government. Next week we hope to give details of the plan of campaign adopted with that end in view.

* * * *

Daggafontein. We are officially informed that the Main Reef has been struck in the Daggafontein G.M. Co.'s shaft at the depth of 3,580 feet. Assays have been taken all round the shaft, and show the value to be 8 dwts. over a stoping width of 40 inches. The sinking of this shaft was commenced in November, 1910. The Main Reef values obtained in the boreholes were as follows: No. 1, 20 dwts. over 5·5 inches; No. 2, 11 dwts. over 7·8 inches; No. 6, 11 dwts. over 23¼ inches; No. 7, 24 dwts. over 6 inches. It will be remembered that the Kimberley reef, which lies approximately 1,300 feet above the Main Reef series, is payable. Assays of the Kimberley reef as obtained from the boreholes gave the following results: 19 dwts. over 8·5 inches, 31 dwts. over 2·5 inches, and 18 dwts. over 7 inches. The significance of the strike to the whole Far East Rand need not be laboured. It is to be hoped that it will facilitate the early provision of capital to develop the property.

* * * *

A Chance to Turn Scrip Into Cash. With the Stock Exchange closed, it is, generally speaking, by no means an easy matter nowadays to convert scrip into cash. An opportunity of doing so is, however, now afforded to holders of Debentures of the Transvaal Gold Mining Estates. This company announces that it is open to purchase for cash a certain quantity of its Debentures, on account of amounts due for redemption on 1st April, 1915, or subsequently. Holders who wish to avail themselves of this opportunity should communicate with the London Secretary, giving the amount of Debentures they offer and the price they would be willing to accept. It is stated that the last price paid was 97½.

* * * *

Village Main Reef. In the course of the quarterly report for the period ended June 30, of the Village Main Reef, it is stated that the Wemmer Mill being closed down, only 160 stamps at the Village Mill have been operated during the quarter; the tonnage milled has not been affected as compared with the first three months of the year. The yield and working costs showed little variation, but the profits increased owing to the inclusion of gold obtained from by-products and a general clean-up of the Wemmer reduction works. The quantity of sand filled into old workings amounted to 25,219 tons.

* * * *

Trading with the Enemy: Official Explanation. The following official announcement was issued by the British Treasury on August 21, and is of obvious application to South Africa: Some doubts having arisen as to the meaning and application of the proclamation against trading with the enemy, the Government authorise the following explanation to be published:—(1) For the purpose of deciding what transactions with foreign traders are permitted, the important thing is to consider where the foreign trader resides and carries on business, and not the nationality of the foreign trader. (2) Consequently, there is, as a rule, no objection to British firms trading with German or Austrian firms established in neutral or British territory. What is prohibited is trade with any firms established in hostile territory. (3) If a firm with headquarters in hostile territory has a branch in neutral or British territory trade with the branches is (apart from prohibitions in special cases) permissible, as long as the trade is *bona fide* with the branch, and no transaction with the head office is involved. (4) Commercial contracts entered into before war broke out with firms established in hostile territory cannot be performed during the war, and payments under them ought not to be made to such firms during the war. Where, however, nothing remains to be done save to pay for goods already delivered or for services already rendered, there is no objection to making the payment. Whether contracts entered into before the war are suspended or terminated is a question of law, which may depend on circumstances, and in cases of doubt British firms must consult their own legal advisers. This explanation is issued in order to promote confidence and certainty in British commercial transactions, but it must be understood that, in case of need, the Government will still be free to impose stricter regulations or special prohibitions in the national interest.

* * * *

Suspension of German and Austrian Patents.

The Board of Trade have issued Rules under the Patents, Designs and Trade Marks (Temporary Rules) Act, 1914, regulating the procedure for the avoidance or suspension of any patent or licence granted to, or trade mark the proprietor of which is a subject of any State at war with His Majesty. Where an application is made to the Board for this purpose they must be satisfied that the applicant intends to manufacture the article concerned or carry on the patented process, and also that it is in the public interest that this should be done. The rules provide also for the avoidance or suspension of any application for a patent or trade mark by the subject of an enemy State. Copies of these Rules may be obtained from the Superintendent of the Sale Branch, Patent Office, 25, Southampton Buildings. The secretary of the British Empire Industrial League, of 55-56, Chancery Lane, W.C., issues the following statement :—"The action on the part of His Majesty's Government in passing an Act permitting the avoidance or suspension of patents granted to persons who are subjects of Germany and Austria does not appear to be appreciated by many British manufacturers, for the reason that 'the Board of Trade may at any time in their absolute discretion revoke any avoidance or suspension of any patent or licence ordered by them.' It is evident that our manufacturers require something more definite and reassuring, so that, after laying down special plant for the manufacture of a particular article, the reinstatement of the patent at the end of the war would not mean that his capital and efforts had been wasted. With respect to trade marks, manufacturers should have some guarantee that there will be no exclusive reinstatement. Otherwise a manufacturer might spend thousands of pounds in creating a trade the benefits of which would eventually accrue to the original alien owner."

* * * *

Share Market Depreciation.

What must be described as a melancholy interest attaches to the present monthly valuation of Stock Exchange securities, given by the *Bankers' Magazine*. In the first place it will be noted that the valuation only covers a period of ten days instead of a month. That is to say, whereas the usual comparison is with the 20th of each month, the present valuation shows the position on 30th July as compared with the 20th of that month, which was the date of the previous valuation. The reason for this fact is, of course, that since 30th July the Stock Exchange, in common with other foreign markets, has been closed. The first point which our contemporary thinks will strike the imagination of readers is the fact that the shrinkage which occurred in the value of 387 representative stocks during the brief period of ten days exceeds any previous decline which has occurred even in the space of a month, and it enables one to appreciate the tremendous adverse influences with which the City had to contend before there came the climax in the shape of the closing of the House. During the ten days in question the list of stocks showed a net depreciation of no less than £188,000,000, the exact figures being as follows :—Aggregate value of 387 representative securities on 20th July, 1914, £3,370,709,000; on 30th July, 1914, £3,182,717,000; decrease, £187,992,000. While the decline in values was of a most general character, scarcely a department escaping the general debacle, the collapse was most pronounced in the markets directly affected by the chief cause operating—namely, the European political crisis. British funds, it will be seen, show a loss for the month of about £44,000,000, and Foreign Government securities gave way to the extent of about £47,000,000. Next to those departments depreciation was specially pronounced in American Railway securities, which were affected by Continental selling, while Home Railways and kindred stocks gave way in sympathy with gilt-edged descriptions. Railways in British possessions were also a very weak spot. In noting the general bearing of this great decline in the value of Stock Exchange securities upon the financial position as a whole, it is important to remember that the decline in securities has been a continuous one, extending over many years. The present list of stocks was selected nearly eight years ago—namely, in January, 1907—when the valuation was £3,843,000,000. Ever since that date, with some occasional interruptions, the movement has been persistently downwards, so that to-day the total shrinkage is not less than £660,000,000, and the cumulative effect of this gigantic depreciation cannot be exaggerated.

* * * *

Success of New Water-drills.

In the course of his last annual report, the Boksburg Inspector of Mines says that towards the latter end of the year two light hammer water rock-drilling machines, viz., the Leyner and the Atlas drills, were introduced into some of the mines. From figures kindly given by the managers using the drills the results are extremely satisfactory. The drills have many advantages over the piston drills in that they weigh only about one-third, require fewer persons to run them and above all it is impossible to work without water, which is fed to the face of the bit through hollow steel. All the drills are star bit and the holes consequently start at a smaller diameter and finish up only slightly less. The cost of the drill is almost double that of the large piston drill and up to now it is impossible to say what the upkeep will be.

* * * *

Coal the Pivot of Civilisation.

When the National Association of Colliery Managers met in Newcastle, Professor Louis, in an address, observed that coal was at the bottom of all civilisation and all industrial advances. Japan's rapid rise to be a great Power is due to the fact that she is the biggest coal producing power in the Far East, and it is not a bold prophecy to venture that Japan will maintain her great position only until China has developed her still greater coal resources, and is able to compete with Japan. What the coal trade requires more than anything else is not more regulations, but fewer regulations, and those more exactly carried out. The professor does not think he can remember a single colliery accident the cause of which was properly traced without its being shown that the accident was due to an infraction of regulations such as are accepted in regular colliery practice. Therefore, what is wanted is not more regulations, but to strengthen the colliery manager's hands so that he can enforce discipline and make it possible for him to insist upon regulations being carried out as they should be.

* * * *

The Trade War.

In connection with the campaign undertaken by the Board of Trade to assist British manufacturers to establish themselves in foreign and Colonial markets in branches of trade which have hitherto been largely in the hands of their German, Austrian or Hungarian rivals, a series of monographs on special groups of trades is being issued by the Commercial Intelligence Branch of the Board of Trade. The trades dealt with so far are cutlery, iron and steel wire, hollow-ware (enamelled or tinned), woollen and worsted piece goods, cotton hosiery, and electrical machinery and appliances. Memoranda on a number of other trades, including certain classes of machinery and iron and steel, will be issued in rapid succession. The Director of the Commercial Intelligence Branch, whose offices are in Basinghall Street, London, E.C., will be ready to receive and answer personal and written inquiries for further information with regard to particular trades and markets. The Board of Trade are also obtaining information through His Majesty's Trade Commissioners and Consular Officers as to the commercial and financial situation in the Dominions and foreign markets, and particulars on this subject will be circulated in the course of a few days for the guidance of British exporters.

* * * *

The Tin Plate Industry.

Discussing the position of the Welsh tinplate industry in relation to the war, Mr. Henry Bond, a director of Richard Thomas & Co., Ltd., has expressed the opinion that provided the oversea routes are kept open and shipping facilities are available, a very large portion of the tinplate mills in South Wales will be able to work. In support of this contention he states that the total export of tinplates last year was 495,000 tons, and the home trade is estimated to be 200,000, a total of about 700,000 tons. Of this quantity the following were the exports to the Continental countries:—Russia 10,000 tons, Norway 25,000 tons, Germany 35,000 tons, Netherlands 43,000 tons, Belgium 13,000 tons, France 21,000 tons, Portugal 15,000 tons, Italy 20,000 tons, Roumania 11,000 tons. An important quantity of the shipment to the Netherlands went through to Germany, but at any rate the trade to the Continent was only two-sevenths of the total trade done last year. It is reasonable to suppose that there would be a big demand for tinplates for packing and that other markets will show an increased consumption. Possibly too the loyalty of the Canadians will help to increase shipments to that country where the supplies are at present largely drawn from the United States, but at the moment the great difficulty is one of finance. Such a reassuring statement from so high an authority in the tinplate trade as Mr. Henry Bond should go far to produre a measure of confidence in the immediate future of the industry.

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The Tuberculosis Report.

The final report of the Tuberculosis Commission was issued this week. It is a bulky volume and contains innumerable recommendations scattered throughout its 370 pages. In concluding their labours the Commissioners again emphasise the fact that measures for combating tuberculosis must begin with the prevention of cases, and that the way to effect this is by improving the conditions under which so large a proportion of the coloured and native population live in urban areas, and by improving the conditions under which they work at industrial centres, especially on the mines. The Commissioners say that in formulating their recommendations they have always endeavoured to reach a moderate and practical solution, and not to advance proposals which, however sound in principle, would not be likely to prove reasonable and practicable if adopted. As for the attacking of the disease, the Commissioners believe that if the measures they suggest evoke the co-operation of the public and are consistently developed on the lines laid down, they will result in the heavy reduction of the suffering and mortality produced by this disease. The Commissioners, however, insist on the necessity for making such measures general throughout the Union, and not confining them to a few of the more progressive centres. That this will entail a certain amount of expenditure is, they say, inevitable, but they do not believe that the cost will be excessive. The report contains the following passage: "It is a matter for surprise that while in every other civilised country systematic endeavour is being made to eradicate tuberculosis, here in South Africa, where a large section of the population is threatened with the worst consequences of the disease, the State has so far done nothing to check its spread. Indeed throughout the length of the Union we know of not a single public institution where a consumptive patient can obtain the treatment proper to the early stages of the disease, and only three where a person dying of it and dangerous to his associates may end his days." The Commissioners also express the hope that measures may be taken without undue delay to stop the further spread of and bring about the eradication of tuberculosis in stock. Regarding the portion of the report dealing with the mines we shall have something to say next week.

TOPICS OF THE WEEK.

THE GOVERNMENT AND THE WAR.

The Union Parliament crammed an extraordinary amount of useful work into the brief special session that closed on Monday. Apart from the opportunity it afforded the Prime Minister, General Smuts, and the Government generally of placing on record their loyalty and readiness to help the Empire, certain very necessary financial measures were placed on the Statute Book. The objects of the four new Acts are almost explained by their titles. They are the Additional Loan Appropriation, the Prieska-Upington Railway Construction Act, the Public Welfare and Moratorium Act, and the Currency Act. The first appropriates a sum of £2,000,000 for the following purposes:—War expenses: Measures which may be taken for the security of the Union; for the conduct of military operations; for assisting the food supply; for promoting the continuance of trade, industry, business, and communications, whether by means of insurance or indemnity against risk or otherwise; for relief of distress; for contributions of articles of consumption of local origin to His Majesty's forces; and generally for all expenses arising out of the existence of a state of war. This is useful and explicit enough. The debates on these several measures brought out no very serious flaw in any of them. The Currency Act may be said to represent for this country the suspension of the Bank Act, since, like the latter proceeding, it permits of the issue of bank notes against securities approved by the Government. Again, the Moratorium is to be applied with considerable limits and qualifications, and is clearly based on the excellent Canadian Act having a similar object. The new railway extension is clearly an expedient undertaking, and the debiting to the Public Loan fund of the expenditure to be incurred in carrying out the present plans of the Union Government is plainly justifiable. In all these directions the Union Government has acted with wisdom, caution, and doubtless upon the advice of the foremost experts. The result will assuredly be to put the finance, industry and commerce of the Union in a position to face without fear the prolongation of the war.

WAR AND THE MINING MACHINERY MAKER.

At this juncture there are certain main considerations upon which the manufacturer of mining machinery should dwell. In the first place there is no fear now that the war will demand the closing of any more big producing mines within the Empire, certainly not if the entire industrial machine runs smoothly and harmoniously, and efforts continue to be made to maintain a proper "load factor," with every effort directed to useful effect. There may be some tendency to spare expenditure on new plant, but we would impress upon mine owners the desirability of taking full delivery under contract, and even of placing new orders where possible, thus to help their friends the manufacturers to provide employment for their workpeople. But whether the wheels at certain doubtful mines continue to revolve for their wonted daily term or not, large supplies of materials are still needed to keep the workings intact; water must still be raised, roofs must be supported, and everything protected against the disintegrating effects of disuse. Is there not a chance here for British mining machinery to come by its own? British-made pumps, steel props, electrical appliances, etc., etc., are every whit as good as the German equivalents with which they have had to compete in the past. Means have now been devised by the Imperial Parliament to overcome the difficulties that seemed to present themselves in the shape of German patent rights. The manufacturer of mining appliances in the past has complained bitterly of German competition in the colonies and dependencies. Is this, then, the time, when that competition is dormant, for the British maker to sulk like Achilles in his tent? All over the world, in British possessions and the lands of friendly Powers, mining is still being carried on without intermission, and mine owners who have used German machinery in the past must perforce turn elsewhere. They may go to America, but why not to Great Britain? Thanks to our navy and our mercantile marine we can still do the business. But some manufacturers are not giving these potential customers a chance; they will not even allow them to know that they exist, at a time when British goods are sure to be favourably regarded, if only on sentimental grounds. It is the same everywhere. The daily Press is now absorbed in war news, and it has ceased to show its wonted intelligent interest in industrial affairs. The man who wishes to know what is going on in his own trade must perforce turn to the technical and commercial Press for his information, some are now probably studying these organs carefully for the first time in their lives. Even though these readers may not be able to place orders now, they will no doubt make mental reservations for the future, and the seeds of peaceful trade may be sown in time of war. If we may coin a motto for our friends the manufacturers, we should say: "Do your best and advertise it." If you don't there are those who will believe that all the time you have been a German firm masquerading under an English name, and that you are no longer in a position to deal!

MINES DEPARTMENT ANNUAL REPORT.

THE annual report of the Mines Department of the Union for the year 1913 made its appearance this week brimful as ever of important facts and figures. It is impossible in this issue to do justice to the enormous mass of valuable, first-hand data collected by the Department, and we content ourselves therefore with a brief reference to the main points of the report. In this category we may place the remarks of the Government Mining Engineer on the outstanding questions of accidents, mine hygiene, ventilation, new rock drills, and the future of the Far East Rand. It is most satisfactory to note that the year's accident death-rate of 3·55 for the Transvaal is the lowest on record, with the exception of the abnormal year 1901-2. This latter period was abnormal in that the ratio of underground to surface workers, instead of being—as usual—over 2 to 1, was approximately 1 to 1, owing to the large amount of reconstruction of plant going on after the war. As the death-rate amongst surface employees is lower than amongst underground men, the average death-rate was correspondingly reduced during that year. The underground accident death-rate for 1901-02 was 5·39, as against 4·73 for 1913. In regard to mine air the Government Mining Engineer states that towards the end of the year the Committee commenced an investigation into the quantity of dust contained in the air of each mine on the Witwatersrand. This extensive work had by April been completed and will form the basis of further investigation and work. No decision has yet been possible on the difficult question of a maximum limit of permissible dust in air other than that contained in Regulation 61, which provides that no person shall work or be permitted to work in any atmosphere in which there is dust perceptible to the senses. It is shown that the action of the Department is having a decided result in improving matters, and surprise inspections at blasting time and at the commencement of the shift have served a very useful purpose and have opened the eyes of managers and other mine officials to a state of affairs of which many of them had to confess entire ignorance. Prior to these inspections and to managers having their attention drawn to these conditions by inspectors, it very rarely happened that mine managers or overseers were underground at blasting time or at the commencement of a new shift. Now matters have so altered that one manager stated that he went underground more frequently at the time stated than at any other time. "It is on such keen spirit and determination that we can rely to see miners' phthisis wiped off the slate. My position as Chairman of the Miners' Phthisis Prevention Committee," adds Mr. Kotze, "which is continuously investigating the numerous problems bearing on the prevention of the disease, obviously debars me from discussing matters which are still under the consideration of that committee. It is unnecessary, however, for me to do so as the Committee reports to the Minister from time to time." In the annual report for 1912 attention was drawn to the fact that although the Mines and Works Act provided for an eight hours' working day in Witwatersrand mines, there was no machinery for effectively controlling or giving effect to this provision. During the year certain additional regulations have been promulgated which are intended to fill up the deficiency. The effect of these regulations is to give the white miner an average period of eight and a half hours underground, including travelling from the shaft to the working-place and back again. The obvious deficiencies in these regulations are that the period spent by some miners underground may exceed eight and a half hours, as long as other miners work less than eight and a half hours so as to bring the average within that period, and that there is no inclusion of natives, who frequently spend much more than eight hours underground through having to wait at the shaft at the beginning and end of the shift. It is, however, difficult to suggest means of overcoming these deficiencies. The question has recently arisen as to the extent to which mines in the districts outside the Rand are to be exempted from the operation of the eight hours' clause under Section 9 (2) (c) of the Mines and Works Act. This matter is still under consideration. The important subject of ventilation is receiving increasing attention on the Witwatersrand. The good effects of giving workers as good air as possible, and thereby improving their health and efficiency, are being more widely recognized. During the year twelve ventilating fans were installed on eleven mines, bringing the total to 40 fans for a total of 65 mines. There is still much room for improvement in the distribution of air currents underground. This is largely a matter of supervision by some one person, and it would pay most mines to put on a special man for the purpose. In regard to rock drills, it is pointed out that partly as a result of this depletion of labour, an increase in the number of rock-drills used in stoping has taken place. During the year approximately 44 per cent. of the rock hoisted was broken by machines. A notable feature of the year has been the introduction and successful application of light rock-drills having hollow steel jumpers through which water under pressure is supplied. These have been so successful that makers of other types are taking up the idea and making attempts to adopt the same principle on their own machines. This new type of machine is to be welcomed not only as offering a hope that the long sought for substitute for the hammer boy may at last have been found, but also from the health point of view, since these drills cannot be used unless the water supply is satisfactory. Drilling dry holes resulting in charging the atmosphere with dangerous dust therefore becomes an impossibility. It is true that by using the appliances now provided on all mines, dust during drilling with the older types of machine can be reduced to a very low figure, but when the appliances are not in order or when they are irksome to use, as for example in raising, the temptation to drill dry holes is frequently too strong to be resisted. In concluding his general review, the Government Mining Engineer says that the far East Rand, including in that term all mines east of the East Rand Proprietary Mines, will in future be the centre of activity in the opening up of new mines. The Modder Deep and Government Areas mines will probably commence crushing in 1914 or early in 1915. The Springs mines have recently struck encouraging values and given renewed encouragement to the idea that at least a fair portion of the large untouched areas carrying Main Reef at workable depths will in time be profitably exploited. The report adds:—"The total area of virgin ground available for future mining in this district runs into many tens of thousands of claims and considerable portions of it will no doubt amply reward the investment of capital. Unfortunately it is at present difficult to secure funds for such purposes and in any case caution demands that the opening up of new ground shall proceed step by step from already proved areas. It is only by the opening up of new mines that the closing down of others by exhaustion can be counterbalanced, and it is to the eastern section that the Rand and largely South Africa will have to look for the maintenance of their credit."

THE GRIEVANCES OF THE "SMALL MAN."

Concerted Action in the "Outside Districts"—Need for Remission of Claim Licences—Demand for More Sympathetic Treatment.

A GENERAL meeting of the Mines and Claimholders' Association was held this week at Pilgrims Rest. The deputation (Messrs. Scrymgeour and Macer) who waited on the Minister of Mines at Pretoria, reported as follows:—

DIGGERS' LICENCES.

The matter of the burden of paying diggers' licences (£1 per claim) on claims which had been worked out was again discussed, but the Minister said he could not do anything in the matter till the law relating to the subject was altered, which means drafting a new Act, and there was little likelihood of this being done at present.

WATER RIGHTS AT FRANKFORT.

This matter of the water-right on Frankfort applied for by Ball was introduced. The Minister, after hearing the deputation, said that new light was thrown on the application, and consented to the reopening of the case.

GOVERNMENT BUSHES.

The matter of mining companies and small owners cutting timber in Government bushes in the vicinity of the mines, conditional on new trees being planted for those cut down, was discussed at some length, and the Minister stated that he would consult the Forester regarding the question. The deputation had since learned that the Forester did not favour the proposal, as it would entail a great deal of extra work of a supervisory character.

EXCESSIVE CLAIM LICENCES.

The heavy burden of claim licences in this district was explained to the Minister. It was shown that, with the horizontal reefs which obtained in this district, and the consequent necessity of pegging somewhat large areas, the charge of even two shillings and sixpence per claim per mensem on Government ground pressed very heavily on the small owner and prospector. The Minister, whilst sympathising with them, said that he was powerless to do anything for them under the Gold Law as it stood. However, he drew their attention to Section 47 of the Gold Law, under which owners of large blocks of claims on Crown lands could obtain mynpachts on the ground on lease for not more than five years at a rent that worked out at about one-third of the amount of claim licences. The question of the action of the Government in reserving large portions of proclaimed fields for forestry purposes was raised in consequence of Mr. W. Davis' motion, which had special reference to Graskop, where good gold-bearing ground, it was alleged, had been reserved. It was pointed out that the Mining Commissioner had the power to reserve unpegged ground on proclaimed ground for such purposes, without giving any notice or calling for objections. It was decided, therefore, to approach the Government with the view of making it compulsory to advertise intention on the part of the Government to reserve ground on proclaimed mining ground in future.

REMISSION OF CLAIM LICENCES.

The burning question of the remission of claim licences during the continuance of the war on claims which were not producing gave rise to a lengthy discussion. The reply of the Minister that he was powerless to do anything was criticised. Eventually it was decided to approach the Minister of Mines to introduce a special clause in the Gold Law to deal with the matter, and also to approach other influential persons and seek the co-operation of other mining bodies in "B" districts, and the following resolution was taken: "In view of the fact that the Minister of Mines advises that, by virtue of his office, he cannot remit claim licences during the war period, and in view of the ruin which faces large numbers of prospectors, diggers and small mine owners in outside districts, we humbly request the Government to introduce a special Act of Parliament, as an addition to the Gold Law, granting remission of claim licences on unproductive properties, to all present claimholders in "B" districts, on both private and Government farms, during the present war period. As the matter is extremely urgent, it is essential that this Act be passed during the coming session." In connection with this resolution the Committee suggested the following: That each individual case should be considered on its merits by a Court consisting of the Mining Commissioner, a member of the permanent staff, and a Mines Inspector. That the claims should have been held previous to the declaration of war. That special consideration be given where men are actually working the claims on which they themselves are paying licences. They pointed out that in many countries these are the normal conditions under which gold claims are held, and that they are only asking for these conditions under the abnormal stress brought about by the war. They laid stress on the fact that, if something were not done to stay the excessive drain of claim licences at this juncture, all the small prospecting ventures will have to shut down; in fact many have already done so. Copies of the resolution were telegraphed to the following gentlemen: The Minister of Mines, the Prime Minister, the Minister of Finance, Sir Percy Fitzpatrick, Messrs. H. C. Hull, C. Joubert, F. H. P. Creswell, Harrar and W. R. Collins, whilst a copy was also sent to the Mine Managers' Association, Barberton, and the Chamber of Commerce, Barberton. On Tuesday one reply was received from Sir Percy Fitzpatrick as follows: "I will certainly try and do my best for you."—*Pilgrims and Sabie News.*

THE YEAR WITH THE SIMMER AND JACK PROPRIETARY.

Points from the Reports of the Directors and Consulting Engineer.

THE working profit earned by the Simmer and Jack for the year ended June 30, 1914, after allowing for the expenditure of £2,968 2s. 8d. on renewals and replacements of machinery, plant, buildings, etc., amounted to £322,678; sundry revenue amounted to £34,125; total, £356,801; less contributions to the miners' phthisis compensation fund, estimated profits tax for the year and French Government duty, etc., £39,359; making a total credit to appropriation account of £317,445. The amount at credit of appropriation account at 30th June, 1913, was £111,340; making a total of £428,786. From this amount there was appropriated:—For dividends Nos. 23 of 6¼ per cent. and 24 of 5 per cent., £337,500; for reserve for additions to and renewals of machinery and plant, viz., amount equal to 2½ per cent. of above dividends, £8,437; less expended on renewals and replacements and charged to working costs, £2,968; total, £342,969; leaving a credit balance to appropriation account at 30th June, 1914, of £85,816. The amount expended on equipment of property, including shaft sinking, during the year was £25,788. The gold held in reserve at 30th June, 1914, stood at 500 ounces of the value of £2,095.

Mr. C. D. Leslie, the consulting engineer, writes:—

A re-estimation of the ore reserve shows that at the 30th June, 1914, the fully developed ore amounted to 2,320,000 mine tons of an average mine grade of 5·4 dwts., and in addition there were some 348,000 tons of partially developed ore to which has been assigned a value of 4·6 dwts. until further development work permits of this ore being valued more accurately. On account of insufficient valuation data, the ore reserve as recorded above does not take into account a considerable reclamation tonnage which remains to be credited to the ore reserve as it is depleted. Development exposures in the lower levels continue to be satisfactory. As compared with the previous year, there was a reduction of 532 in the average number of natives employed. The amount of ore treated was decreased by 142,600 tons, while working costs were increased by 1s. 3·142d. per ton milled, the total working profit (excluding profit from accumulated slimes) being £318,121 8s. 2d., or £147,918 7s. 5d. less than for the preceding year. Notwithstanding the many points on the property which have to be manned, irrespective of fluctuations in the amount of tonnage dealt with, the tonnage efficiency works out at an average of 292 tons per native for the year, as against 293 tons per native for the previous year. Shortage of native labour, the white workers' strike of July, 1913, and the period of unsettlement which prevailed until after the second strike of white workers in January last, account for the decreased tonnage and consequent higher working costs, and for most of the decline in profits, which were also influenced adversely because the recovery value was lower by 8·267d. per ton, equal to £26,509 10s. 3d. over the total tonnage milled for the year. The mine is taking advantage of the recent improvement in its native labour supply.

ANSWERS TO CORRESPONDENTS.

J. E. (Messina). No useful purpose is to be served by publishing your letter at this juncture.

A. K. H.—Thanks; will use next week.

FACTS ABOUT MINERS' PHTHISIS.

Points from the Board's First Annual Report—Valuable Statistics—Light on Important Questions.

THE first annual report of the Miners' Phthisis Board dealing with the period from August 1, 1912, to July 31, 1913, has just been issued. During the year 3,665 applications for benefits were received. Of these 3,126 were investigated, leaving 539 for investigation. A number of the latter were from miners and dependents residing overseas. Awards were made to 2,733 applicants, and 393 applications were refused. The awards amounted to £785,079, £343,411 of which was distributed to beneficiaries, leaving a contingent liability of £441,668. The sum of £72,693 was distributed in monthly payments and single sum payments, and partial award payments amounted to £170,717. Allowances accounted for another £10,898. An interesting feature is the smallness of the total expenditure—£10,900, or 3 per cent. on the amount raised and distributed. Of that amount less than one-third was spent on the Board and staff, and more than fifty per cent. of it on medical fees and investigations. It will be appreciated, says the report, that rarely indeed has a Board, charged with the collection and disbursement of such large sums of money, incurred so little cost to the country. One item calls for special attention, namely, rent—£467 15s. 5d. The office accommodation provided for the Board and staff is inadequate and unsuitable, and when regarded against the amount of rent it cannot be said to be economical The Board wishes to emphasise that, in view of the large number of persons who are called before it, and miners who attend daily at the offices to make inquiries or to hand in their certificates and service records—many of whom are affected with advanced tuberculosis—the air space is grossly inadequate. No barrier exists to segregate the officials from the public, and it is hardly reasonable under these adverse conditions to expect from the staff a satisfactory day's work or the maximum of efficiency. From a business point of view, general office accommodation should be provided on the plan adopted by banks or other money collecting or distributing establishments.

UNDERGROUND SERVICE.

In the matter of the underground service of miners examined before the Board on oath, in 531 cases seventy-seven were recorded with less than a total underground service of three years and thirty-four had service exceeding eight years. Out of 1,165 cases seventy-nine had a total service of under three years, and 408 of more than eight years, while 58·2 per cent. had served between three and under eight years. In the more serious cases, the Board found that the purchase of land by beneficiaries was seldom in the interest of themselves or their dependents, and before the close of the year beneficiaries were advised to lease land, with the right to purchase, so that a larger amount might be devoted to stock and farming implements, reserving a balance of the award to be continued in monthly payments. Under such circumstances, the balance in monthly payments would provide them with necessities of life during the period in which their farming operations brought in no return. In these cases the Board, on application, acting under the provisions of Section 19 of the Act, increased the amount of one monthly payment by a sum sufficient to meet the object they had in view and thereafter the original amount of the monthly payment was continued. After the first few months it was found that it was not in the interest of miners, who were in a delicate state of health, to repatriate them. It was reported from England that so large a sum in cash as the balance of the award of £400, placed in the hands of a man often in an unduly optimistic state of mind, was, on arrival at his destination, liable to misused among his friends to the detriment of himself and his family, particularly the latter.

SENDING THEM HOME.

It appeared to the Board in view of these reports that Section 19 of the Act also afforded ample authority to award money enough to pay the passage money of the miner and his family when they desired to be repatriated, and this section has been largely used for this purpose. Even after European beneficiary miners had been repatriated, it was experienced that £8 a month in Europe was more than sufficient, in most cases, to maintain them in the same standard of life to which they had been used, and that the surplus was frequently misused in the same manner as the single payment. There are, of course, admirable exceptions, but as a general rule it has been experienced that it is in the best interests of beneficiary dependents, that the amount of the monthly payments should be reduced so as to accord better with their requirements, and the number of such payments correspondingly increased. The excellent accommodation, food and open-air amusements provided for sufferers at the Sanatorium has warranted the Board in advising more delicate and seriously affected beneficiaries who desire to repatriate to stay at the Sanatorium for some time before proceeding oversea. In many cases the health of the patients so far improved that they were able to undertake the journey without difficulty. There is no doubt that the Sanatorium is very efficiently managed and has fulfilled a most useful function.

USE OF COMPENSATION MONEY.

In discussing the employment of compensation money, the Board states that in the larger proportion of cases the beneficiaries are not incapacitated from doing light surface work, while in almost all cases in class "A" the beneficiaries are able to do some kind of manual labour. These beneficiaries may be considered under two descriptions, namely, (1) those of South African birth, almost all of whom have had South African farming experience, and (2) those who have come from oversea with the special object of mining in this country, or who have taken to mining since, as a means of earning a livelihood. The Board has reason to believe that a considerable number of such beneficiaries in the first category who are not too seriously incapacitated, have reaped considerable benefits in health to themselves and support for their wives and families. With regard to the second description of beneficiaries, namely, those from oversea, a considerable number of whom have their families in this country, but few friends or relations engaged in farming occupations, the Board feels that unless a scheme of land settlement is adopted under sympathetic Government supervision and guidance which would afford suitable beneficiaries an opportunity of occupying allotments or small holdings at a small initial cost, for the purpose of agriculture, fruit growing or raising poultry or other profitable use, there is no alternative for them and their families but to leave the Union and seek work elsewhere, receiving their compensation money wherever they may be. On the other hand part of the compensation money would be employed productively on small holdings in this country for the benefit of the beneficiaries and particularly their children, whereas monthly instalments paid oversea are merely consumed without securing any lasting benefits whatever.

Rand Klip.

The directors' report for the year ended 30th June, 1914, to be submitted at the fourteenth ordinary general meeting of shareholders, to be held on the 4th day of November, shows that the available cash at the close of the year was £13,137, after providing for sundry current creditors. The net expenditure, including the cost of caretaking, for the year was £1,086. The property has been in the charge of a caretaker throughout the year. Owing to the conditions of the financial market it has been impossible to bring forward a satisfactory scheme to provide working capital for the further exploitation of the property.

RAND MINE NATIVE LABOUR COMPLEMENTS.

Facts from the Native Recruiting Corporation, Ltd.—Percentage of Underground Complements Available at June 30, 1914.

THE following figures show the underground complement (including special allowances), percentage of underground complement, and total native labour strength (underground and surface):—

Name of Company.	Underground Complement (including Special Allowances).	Percentage of Underground Complement.	Total Native Labour Strength (Underground & Surface)
PRODUCING MINES			
Bantjes Consolidated	3,079	65·44	2,385
Brakpan Mines	4.177	71·07	3,589
City Deep	4.755	67·40	3.776
Consolidated Langlaagte	3.640	75·52	3,246
Consolidated Main Reef	2.185	74·09	2,226
Crown Mines	14.851	77·03	13,749
Durban Roodepoort Deep	2.376	102·35	2,979
East Rand Proprietary	13.614	77·89	13,663
Ferreira Deep	3,445	75·55	3,577
Geduld Proprietary	2.041	56·78	1,516
Geldenhuis Deep	4.084	80·53	4,147
Glencairn Main Reef	1,027	76·24	1,196
Government Areas	2,250	54·62	1,779
Knight Central	2,317	71·34	2,174
Knights Deep	5,333	72·52	4,803
Main Reef West	2,634	54·51	1.643
Modderfontein B.	2,107	73·04	1.986
New Goch	2,033	70·92	1,949
New Kleinfontein	4,822	67·91	*4,143
New Modderfontein	3,256	59·76	2,637
New Primrose	1,300	81·76	1,468
Nourse Mines	4,878	66·03	3,962
Princess Estate	2,765	66·87	2,437
Robinson Deep	4,020	61·79	3.112
Robinson	3,233	67·58	3,001
Roodepoort United	3,000	62·16	2,379
Rooiberg Minerals	475	96·63	702
Rose Deep	4.182	74·41	4.053
Simmer Deep	5.076	53·36	3.257
Simmer and Jack Proprietary	3,167	54·75	2.424
Van Ryn Deep	2,999	62·25	2,385
Van Ryn Estate	2,245	86·68	2,534
Village Deep	3,360	73·66	3.172
Village Main Reef	2,871	57·22	2.163
West Rand Consolidated	3,221	68·05	2.648
Witwatersrand Deep	3,510	52·39	2.542
Witwatersrand	2,519	75·86	2,514
Wolhuter	2.091	89·67	2,502
	138,938	70·30	124,418
Aurora West	1,384	74·71	1.299
Durban Roodepoort	954	80·29	1,009
Ginsberg	1,330	67·66	1,211
May Consolidated	1,019	73·60	984
Meyer and Charlton	869	66·16	798
New Rietfontein	613	78·95	656
New Unified	918	71·13	858
Sub Nigel	761	62·15	603
Vogelstruis Estates	1,476	78·72	1.443
Total producing mines	148,262	70·47	133.279
DEVELOPING MINES—			
Modderfontein Deep Levels	1.242	95·97	1,487
Springs Mines	902	49·11	623
Mines not working	–	–	59
	150,406	70·55	135,448

*New Kleinfontein: Includes 178 natives in Apex Gold Compound.

THE POSITION OF THE SUB NIGEL.

Summary of the Annual Reports.

AT the Sub Nigel the fully developed ore reserve at 30th June, 1914, is officially estimated at 160,000 mine tons, valued at 7·2 dwts., and the partially developed ore at some 69,000 mine tons, to which has been assigned from valuable information a value of 8·5 dwts. Tonnage and value have been calculated on an increased stoping width of about 2·1 inches as compared with last year, to conform with larger stoping widths now prevailing, due partly to difficulty with hanging wall in the "D" shaft section, and also, to some extent, to anereased proportion of machine stoping. The development footage accomplished during the year amounted to 5,557 feet, of which 3,995 feet were sampled indicating a reef width of 11·06 inches and a reef value of 24·88 dwts. Disclosures in "D" shaft continue to be satisfactory, and the limited amount of development work accomplished below the longitudinal dyks in "E" shaft indicates that there is some hope of finding zones of enrichment in the extensive western area of the property. The consulting engineer, Mr. C. D. Leslie, in the course of his annual report, adds:—

> From 57,655 tons treated a working profit of £19,203 13s. was obtained, and the gold reserve account was increased from 600 to 780 ozs. The recovery value was lower by 1s. 9·288d., and working costs higher by 1s. 1·914d. per ton milled. The percentage extraction was increased from 94·465 per cent. to 95·701 per cent., making an improvement in residues of 0·145 dwt., equal to 7·293d. per ton imlled. As compared with last year, an additional amount for exploratory development of £1,049 11s. 4d., equal to 4·369d. per ton milled, was charged to working costs, which were also influenced adversely by the industrial unrest which took place and also by shorter hours o fwork. "C" incline shaft is being advanced so that ore from the lower workings of "B" and "D" shafts may be centralised there for delivery to the reduction works so as to avoid surface transport of ore. A new 35 drill compressor has been brought into use, partly for the purpose of increasing the rate of development to meet the requirements of the reduction plant which is being enlarged to a capacity of 8.000 tons per month. This enlargement of plant may not be completed by the end of March as was expected, because of delay in the arrival of material due to disturbances in Europe.

Labour Disputes and the War.

Sir George Askwith, speaking at the Cambridge Summer Meeting on "Arbitration and Conciliation in Trade Disputes," said that throughout the country when war became imminent all the great organisations of employers and workpeople had sunk their domestic quarrels, and met together to units in a concerted effort for the welfare and preservation of the nation. The London building trade dispute and the threat of a national lock-out had been closed by an agreement on certain points, the Marine Engineers' Union told their men to proclaim a truce by resuming work, the electricians in London on both sides had done the same; the shipbuilding and engineering trades had withdrawn their demands for an eight hours day; the ship-repairers had laid aside disputes, and stated that their whole resources would be placed at the country's disposal; the engineers and boilermakers had withdrawn their demands on the Great Western Railway, the dock labourers and the General Labourers' Union had followed suit. The Mersey Dock and Harbour Board dispute in Liverpool had been settled after long conferences arranged by his Department, and he himself had been arbitrating as fast as possible in various trades. In the coal trade the trimmers and tippers had intimated that they would work by day or by night, the Scottish coalowners had withdrawn their demand for a reduction of wages, in South Wales the Coal Conciliation Board had unanimously agreed that one hour extra work per day was to be given in all coal pits producing coal for the Navy, and a joint committee had been established for the settlement of all other disputes.

THE DIAMOND DEPOSITS OF GERMAN SOUTH-WEST AFRICA.—II.

History and Description of the Discovery—Extent of the Fields—Topographical Details.

[BY DR. PERCY A. WAGNER.][*]

THE DIAMONDIFEROUS DEPOSITS.

The diamondiferous deposits as previously signified are confined to certain valleys and depressions, their elevation ranging from a few feet above sea-level to over 500 feet on the Fiskus claims, to the south east of Kolmanskuppe. The diamond occurs in a superficial bed or layer of variable thickness composed of from 60 to 80 per cent. of fine yellow sand and from 20 to 46 per cent. of coarse particles, ranging from 1 to 10 millimetres in diameter. The coarse material, derived partly from the destruction of the sandstones previously referred to and partly from the disintegration of the ancient rocks of the basement system, is made up of rounded and faceted[†] particles of milky quartz, white felspar, yellow chalcedony, banded agate, red jasper, red garnet, epidote, magnetite and specular iron, generally accompanied by fragments of granite and gneiss. The uppermost portion of the deposit, which as a rule has been lashed by the force of the wind into regular waves or miniature dunes, is always found to be composed entirely of the coarse material, the finer particles having all been blown away. This process of natural concentration proceeds continuously, the percentage of coarse particles being thereby steadily increased while the sand goes to swell the vast volume of the dunes. As a result of the same action the diamonds scattered through the sand and gravel slowly find their way to the surface of the deposit and into the crests of the waves, where a considerable enrichment is invariably found to have taken place. In the Pomona area, and particularly in the celebrated Ida Tal. this concentration has proceeded to such an extent that not only the sand but most of the larger particles have been swept away and there remains in places but a single layer of comparatively coarse and fabulously rich detritus, spread irregularly over the wind-scoured surface of the underlying limestone. Apart from the superficial enrichment one frequently finds a considerable concentration of diamonds to have taken place on the windward side of obstacles, such as the outcrops of resistant dykes and quartz veins, which rise above the general level of the deposits; and also at the head of valleys facing the direction of the wind. The thickness of the diamond-bearing material does not as a rule exceed 3 or 4 inches, but in portions of the Kolmanskop and Stauch claims it is as much as 8 metres. In sections afforded by these deeper workings one generally sees alternations of fine sand and gravel; some of the lower layers of gravel having apparently been enriched in the same manner, though not to the same extent, as the superficial portion of the deposit. The distribution of the diamond through the detritus is on the whole very irregular. On the Stauch and Fiskus claims, there are persistent, well-defined strips of payable gravel, up to 350 metres in width, extending along the lowermost portions of the depressions in which the claims are situated. As a rule, however, one finds rich patches alternating with practically barren areas, sometimes of considerable extent; and in many instances the diamonds appear to be confined to narrow streaks or "runs." It is on this account an extremely difficult matter to assess even approximately the probable yield of any particular gravel deposit, and most estimates of this nature that have been made have proved quite incorrect. The diamond content of the gravel at present being worked on different sections of the field varies between wide limits. The highly concentrated detritus in the Ida Tal at Pomona yields up to 60 carats per cubic metre, and on the claims of the Deutsche Diamantengesellschaft, to the south of Pomona, there are also rich patches of gravel averaging 10 carats to the cubic metre. Such values, however, are quite unusual, and in most instances very much poorer material is being treated. On the Kolmanskop claims, for example, an average of 1,500 carats of diamonds was, during the year 1912, recovered per hectare of ground exploited. The average quantity of gravel obtained per hectare amounted to 3,886 cubic metres, and the average yield per cubic metre was therefore only ·386 carat, equivalent to ·175 carat per load.

DIAMONDIFEROUS DEPOSITS OTHER THAN THOSE ALREADY DESCRIBED.

In addition to its occurrence in the normal sand and gravel deposits the diamond has also been found in peculiar terraces of shingle. The best illustration of a deposit of this nature is to be seen about a mile to the south of the Bogenfels camp, where a narrow crescent-shaped ridge of shingle—clearly of the nature of a "storm-beach"—stretches across what, at no very distant date, must have been a shallow tidal lagoon. The ridge, about 8 feet in height, is built up largely of flattened pebbles of chalcedony, jasper and agate, many of which show very little wear. The diamond appears to be practically confined to an agate layer near the base of the deposit.

CHARACTERISTICS AND PROPERTIES OF THE DIAMONDS.

It may be stated at the outset that the leading South African experts are agreed that the G.S.W. African diamonds are wholly unlike those of any known source of production—primary or alluvial—in British South Africa. This view is endorsed by the Antwerp and Amsterdam cutters, who maintain that the stones in their physical properties more closely resemble the product of the Brazilian fields. The quality, which is much the same throughout the littoral, is exceptionally good, which circumstance accounts for the fact that, notwithstanding their diminutive size, such enormous numbers of these stones are absorbed by the world's markets. As regards crystallisation rhombic dodecahedra, with somewhat rounded faces, predominate, though octahedra and octahedral (twins) are quite common, and cubes are also said to occur. Cleavage fragments are comparatively rare and bort almost entirely absent. Fully 85 per cent. of the stones are fit for cutting. In consequence of the violent attrition to which they have been subjected, many of the crystals show unmistakable signs of wear, but typically water-worn stones, such as are so common on the Vaal River Diggings, do not appear to occur. The diamond is found in all shades of colour, clear white crystals predominating. The following analysis[*] of a parcel of 1,558 stones is particularly informative in this connection:—Stones of clear white colour or with a slight yellow tinge, 819; stones of delicate yellow colour, 136; stones of lemon yellow, 87; stones of pale pink, 116; stones of dark red, 9; stones of bluish, 30; stones of greenish, 5; stones of blackish, 9; stones showing various colours, 68; stones showing impure and turbid shades, 62; cleavage fragments, white and pink, 217; total, 1,558. In weight the diamonds range from 1-20 carat, and less, to 34 13-16 carats in the case of the largest stone hitherto found; the average for the claims at present worked being almost exactly $\frac{1}{6}$ carat. Considering the field as a whole it has been established that there is a steady—if not quite consistent[†]—increase in the average size of the diamonds as one proceeds from north to south, until the Pomona area is reached, where the average weight is greater than anywhere else. To the south of Pomona there is again a falling off in this respect, as witness the following table, in which the weights of the largest stones hitherto found in the more important localities are also given:—

Locality.	Average Weight (Carats).	Weight of Largest Stone (Carats).
Conception Bay and Spencer Bay...	$\frac{1}{10}$ — $\frac{1}{12}$	1
Kolmanskop	$\frac{1}{8}$ — $\frac{1}{9}$	$2\frac{3}{8}$
Stauch and Fiskus Claims ...	$\frac{1}{5}$ — $\frac{1}{6}$	$3\frac{1}{2}$
Pomona	$\frac{1}{2{\cdot}5}$ — $\frac{1}{3}$	$34\frac{13}{16}$[‡]
Bogenfels	$\frac{1}{4}$ — $\frac{1}{5}$	$17\frac{1}{4}$
Frohe Hoffnung	$\frac{1}{5{\cdot}26}$	3
Angras Juntas	$\frac{1}{5}$ — $\frac{1}{6}$	1

(*To be continued.*)

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[*] Abstract from "The Diamond Fields of South Africa," by Dr. P. A. Wagner.

[†] A considerable proportion of the coarse particles are always in the form of regular Dreikanters.

[*] cf. *The Manufacturing Jeweller.* February 9, 1911.

[†] The writer (217) was originally of opinion that there are three definite areas within which the diamonds attain a maximum average weight, but in the light of more recent investigations by Dr. Carl Krause this view can no longer be upheld.

[‡] This particular stone, together with one of 33 carats, was actually found on the claims of the Deutsche Diamantengesellschaft immediately to the south of the Pomona boundary. The largest stone hitherto found on the Pomona claims weighed 10 carats.

The Complex-Ore Problem.

An interesting discussion on the economics and metallurgy of complex-ores is proceeding in the columns of *Metallurgical and Chemical Engineering.* One writer, whilst admitting the need for a new process which will effectively treat certain classes of complex-ores, says: "It is not a fact that poor methods make the losses high, but that the handling of ore-dressing methods is deplorable. There are only a few plants practising ore dressing that do so with the idea of getting every pound of available material. . . . . The poor quality of mill operation is no doubt responsible for the notion that there is a complex-ore problem." After all, however, there are very few ore deposits lying unworked for want of a suitable process; there is generally some other contributing cause, such as transport difficulties and inaccessibility, high fuel costs, insufficient ore developed, etc. For the most part the complex-ores can be treated successfully by mechanical methods of concentration and separation. A consulting engineer of any standing would hesitate to recommend any new and untried process until it has demonstrated its effectiveness on a working scale; he would rather adhere to known methods, even though milling losses were considerable. Of course it must be remembered, as another contributor points out, that no method of treatment can be considered the best for all complex ores. Each ore is a problem in itself.

ACTING GENERAL MANAGER AND UNDERGROUND STAFF OF THE ROSE DEEP, LTD.

Bottom row (left to right): R. Wright (Foreman Timberman), S. Hill Lewis (Mine Captain), L. P. de Castle (Mine Captain), H. W. Adler (Underground Manager), Paul Selby (Acting General Manager), J. Houston Smith (Mine Captain), E. Rowe (Mine Captain), W. Wilkinson (Assistant Mine Captain), W. S. Hunter (Shift Boss).

Second row: C. N. Hutchens (Shift Boss), H. Unwin (Shift Boss), R. P. Channer (Shift Boss), J. Wearne (Shift Boss), E. Martin (Shift Boss), A. D. Aitken-Connell (Shift Boss), H. Fulton (Shift Boss), J. H. C. Attwell (Native Controller).

Top row: A. Mentjes (Native Controller), J. Ralph (Shift Boss), H. N. Osselton (Shift Boss), A. W. Johnson (Foreman Timberman), G. A. Doig (Shift Boss), W. Atkinson (Foreman Timberman), F. C. Honey (Shift Boss).

Sitting on ground: Isaac F. Klapper (Acting Underground Manager's Clerk).

Olliver, Photo, P.O. Box 3354.

MINING MEN AND MATTERS.

The next general meeting of the S.A. Institute of Electrical Engineers will be held on Thursday the 24th inst at 8 o'clock

* * * *

Professor Yates opens the new session for mine officials at the end of this month. Full particulars of all courses are obtainable on application at the Institute.

* * * *

The ordinary general meeting of the Chemical, Metallurgical and Mining Society of South Africa will be held in the Lecture Theatre, South African School of Mines and Technology, Johannesburg, to-night at 7.45.

New Goch.

Report for the quarter ended June 30, 1914. Number of feet driven, sunk and risen, 1,278; footage sampled on reef, 1,053; average stoping width, 50 inches; average assay value over stoping width - payable (893 feet sampled), 8·43 dwts.; low grade (160 feet sampled), 1·82 dwts.; ore mined, 100,752 tons; less waste ore discarded (11·763 per cent.), 11,852 tons; ore sent to mill, 88,900 tons. Total yield: Mill, 14,805·360 ozs., equal to 3·320 dwts. per ton milled; cyanide, 7,874·247 ozs., equal to 1·765 dwts. per ton milled; total, 22,679·607 ozs., equal to 5·085 dwts. per ton milled. Working expenditure, £64,044 6s. 4d., equal to 14s. 4·316 per ton milled; working profit for quarter, £32.081 7s. 9d., equal to 7s. 2·318d. per ton milled.; revenue, £96,125 14s. 1d, equal to 21s. 6·634d. per ton milled. No allowance has been made for the Government tax on profits. Capital expenditure, £99 14s. 10d. The working profit shows an increase of £6.677 10s. 3d. over that for the previous quarter. The average development values, as shown above, represent the actual results of sampling, no allowance having been made for any reductions which may subsequently be considered advisable when compiling the ore reserves.

Olifants Tin and the Water Question.

The annual meeting of the shareholders of the Olifants Tin Mine was held this week, Mr. E. Brayshaw presiding. In moving the adoption of the report, the Chairman said: Innumerable prospecting holes, shafts and surface lenzes have been worked during the year, giving hundreds of tons of good stuff. These have been done in order to locate a "lead" that would enable us to get down to lower levels with a better chance of striking something permanent. So far nothing permanent has been located, except evidences in the vicinity of Nos. 5, 11 and 13 shafts, where good lenzes and bunches of ore have been taken out, and should lead to permanent ore bodies in depth. Mr. Munnik in his report recommends doing some drilling to a depth of 200 feet in order to expedite the work. This is now under consideration by the board. Our trouble at the moment is we are hauling only by windlass, which practically does not allow us to go beyond 100 feet. We have taken out a large tonnage of ore, in fact enough to keep a five-stamp mill going for two years. Our difficulty is water—as a matter of fact we have to get drinking water from the Olifants River, six miles away. If we had had it on the ground the company would have had a small plant going some time ago, as sufficient ore can be got out to pay all expenses of development. You can understand it is quite another matter when we have to pump water six miles We hope in respect to this to be able to have a joint scheme with the Transvaal Consolidated Lands Company, who are opening up on the same formation adjoining us. We have a very valuable property, and I think by the time we meet again shall have proved it thoroughly. The report was adopted and the auditor reappointed.

Manicaland Output.

The mineral output of the Companhia de Mocambique (Manicaland) for the month of July, 1914, was as follows: Reef: Mill: Gold won (fine), 310 ozs. 0 dwts. 15 grs.; tons, 822; value, £1,285 3s. 1d. Concentrates (estimated): Gold (fine), 1 ozs. 0 dwts. 14 grs.; tons, 2·75; value, £16 18s. 7d. Also contains silver and lead, value £11 16s. 9d. Cyanide (estimated): Gold recovered (fine), 3 ozs. 0 dwts. 0 grs.; tons, 18; value £12 9s. 0d. Alluvial: Gold recovered (fine), 1,197 ozs. 12 dwts. 14 grs.; cubic metres treated, 98·117; value, £1,998 17s. 6d.

RESEARCH IN THE MINERAL INDUSTRY.*

Plea for State Aid to South African Mining.

[By Prof. G. H. STANLEY.]

THE absence of certain data (in regard to tube mill efficiency) to which I have drawn attention indicates one of the many directions in which further research is necessary. I am not, of course, the first to call attention to the need which exists for such work to be done. Dr. Caldecott and Mr. Stadler, notably, have urged its importance, and it is understood that a large amount was done by the Mines Trials Committee, now disbanded, but not for publication. With regard to other necessary work, it is only needful to glance at the position with regard to certain "refractory" gold occurrences to realise how necessary such work is and how difficult, if not impossible, it is for it to be undertaken by individuals. Rather should the Government, a potential partner in profits, come to the assistance of the industry and undertake the duty. Our enormous deposits of easily treated banket so overshadow in importance any other known gold occurrence that we are apt to think lightly of other occurrences of different nature in "outside" districts. Some of them, of course, are being successfully worked, but there are others of sufficient magnitude to have received, in other countries, more attention than they have done in this. I do not, of course, wish it to be inferred that they have not in many cases had a lot of money and trouble expended upon them, but it has often been a very futile expenditure from causes which need not be unduly elaborated, but which include the erection of plants for stamp milling and cyaniding as on the Rand, for ore which is totally unsuited to such treatment. After such an experience, shareholders and all concerned are apt to become discouraged, the property acquires a bad reputation, and it is difficult or impossible to attract fresh capital and make a new start, not necessarily to work the mine, but to first find a suitable process. There are some ores which seem to resist all known methods, and others for which known methods, though they might extract gold, would not be possible under the existing circumstances. Nevertheless, I believe there are properties for which a profitable treatment could be devised, and the fact that they are lying idle obviously means also that labour they might employ is not being employed, there is no distribution of wages, circulation of money and trade; no profits tax, and often no claim licences being paid to the national revenue, and no dividends either. When a new discovery is made and certain exploratory and development work carried out, any capable metallurgist would be able to suggest and test methods of treatment and recommend accordingly. But it might be found that the ore was not amenable to any of the ordinary treatment methods, and a long and expensive investigation with respect to the causes of difficulty and solution of the treatment problem might be indicated. Many, I might say most, owners at this stage, particularly the smaller ones, would decide to drop the venture, and consider themselves fortunate that they had not discovered the true character of the ore through the failure of an expensive plant. At this point, then, I am of opinion that the Government should step in, as an interested party, and cause the required investigation to be made. It would perhaps be possible to commission a practising consultant to carry out the work, but two difficulties at once become apparent which would prevent this being always feasible. First, the work to be done is so indefinite as to nature and probable time occupied that it would be almost impossible to quote a fair fee, and, secondly, certain appliances and apparatus which might conceivably be found necessary are only to be found in a more or less complete testing plant In other cases the real difficulty might be due to the limited financial resources of the owners of the property, and then the Government might assist financially in finding a suitable process. Similar cases arise in connection with other methods than gold, and also with non-metallic minerals, of which many occurrences are known. Surely in connection with the exploitation of oil shale, asbestos and graphite there will be work to be done, not to mention the better utilisation of coal and its by-products. The Government has not been entirely unmindful of its duty in this respect in the past, as instanced by the grant from the "Prospecting Vote" in aid of the equipment of the ore treatment laboratories of the South African School of Mines, which are available under certain conditions for testing parcels of ore. These, in conjunction with the remainder of the metallurgical and assaying department and the other laboratories of the Institution, provide most of the essential apparatus and appliances required for the conduct of such investigations, though admittedly certain extensions and additions would be desirable. But with this contribution the direct Government provision ceased; any investigation undertaken is by private individuals or by the instructional staff, whose time for such work is all too limited. It would be too much to expect that the Government would establish an entirely new set of laboratories for the purpose I have outlined, though in Canada this has recently been done, and indeed the present laboratories are suitable; but obviously a suitably trained staff would be necessary, and, as a commencement at any rate, the provision of this staff and necessary running expenses would be all that would be required. The financial outlay would be therefore very small in comparison with possible or even probable increase of revenue to the Government in the directions I have indicated, without considering the concurrent advantages of increased employment. At the same time, there is work of somewhat different character to be done, not directed entirely to financial gain, but primarily of value for its scientific interest, though, as in many cases heretofore, such work often has unexpected results in the former direction; for example, the elucidation of the laws of crushing and the efficiency of crushing machines, and the causes of failure of stems and cam shafts, which might very conceivably result in considerable practical advantage. The work undertaken might therefore be considered as falling under either of two heads (a) for the elucidation of ore treatment problems, and (b) for affording information of value to the industry in connection with existing methods of treatment. In either case the work undertaken would be selected so as to be, as far as possible, of value to the industry as a whole, though at the same time the position of the Government as a "partner" in profits of successful mines would have to be kept in view. Details, of course, would require to be settled, but I trust that something will eventuate as a result of this suggestion, with advantage to the mineral industry and the nation.

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*From the inaugural address of Professor Stanley, the President of the Chemical, Metallurgical and Mining Society of South Africa.

Natal Coal Outputs.

The output of the collieries connected with the Natal Coal-owners' Society for the month of August, 1914, was:—Dundee, 36,904 tons; Natal Navigation, 29,839 tons; Vryheid (Hlobane), 25,342 tons; Durban Navigation, 21,589 tons; Natal Cambrian, 18,131 tons; Utrecht, 15,450 tons; Glencoe, 15,021 tons; Hatting Spruit, 11,569 tons; Elandslaagte, 11,022 tons; South African, 10,406 tons; Newcastle, 7,041 tons; Ballengeich, 6,369 tons; Natal Steam, 5,632 tons; Ramsay, 5,472 tons; Fairleigh, 3,070 tons; Wallsend, 2,748 tons; total, 225,610 tons; July outputs, 208,364 tons; increase, 17,245 tons.

OIL AND THE NAVY.

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THE TRADE WAR WITH GERMANY.

Action by the British Board of Trade—What British Manufacturers Are Doing—Need for Co-operation.

We direct attention to the appeal from the Secretary of the South African National Union, printed elsewhere in this issue. The British Board of Trade have issued the following invitation:—

> In view of the cessation of imports from Germany and Austria-Hungary, and the fact that there are many articles hitherto imported from these countries of importance, if not of necessity, to British manufacturers, information is invited by the Commercial Intelligence Branch of the Board of Trade from importers of such articles, as to their precise nature and quality, in order that steps may be taken to ascertain whether similar goods might be produced in this country, and, if so, where; or, if not, from what neutral sources they could be obtained. Doubtless in a large number of cases importers have already taken steps to inform themselves on these points, but from cases which have come under the notice of the Commercial Intelligence Branch, it is believed that in some instances it has not proved an easy matter to obtain the necessary information, and it is thought that in such cases the Branch may be able to render some assistance.

We understand that the invitation of the Commercial Intelligence Branch of the Board of Trade to which we refer above has met with a ready response, and there seems to be every prospect that in the near future a large proportion of goods formerly imported from Germany and Austria will be made in the United Kingdom and the British Dominions. Then in regard to German trade with neutral markets and the Empire, the Board of Trade, the Foreign Office and the Secretary of State for the Colonies are taking active steps with a view to its diversion into British channels. By way of a practical beginning the Board of Trade is issuing a series of pamphlets, dealing with special groups of trades in which Germany and Austria have secured a marked predominance, and these are being sent direct to large numbers of British manufacturers and merchants. The question has also been taken up vigorously by the Secretary of State for the Colonies, who has telegraphed to some of the more important Colonies not possessing responsible government to remind them that it is of the utmost importance to have full and up-to-date information respecting the principal imports into each Colony from Germany and Austria, and as to the products of each Colony hitherto exported to those countries. Samples to illustrate the particulars are requested. As regards neutral foreign countries, the Secretary of State for Foreign Affairs has undertaken to send a similar request to His Majesty's consuls in all places where such an inquiry is likely to have a useful result. It is announced that as soon as the samples from different parts of the Empire and from neutral countries are collected, the traders and manufacturers of the United Kingdom will have an opportunity of inspecting them in a central exhibition, possibly at the Imperial Institute. Action having a similar purpose is also being taken by several unofficial bodies, including the British Empire Industrial League, and the National Patriotic Association. The latter is understood to be forming a committee of some of the leading manufacturers having the organised siege of Germany's markets as one of its principal objects, while it will also endeavour to induce British banks to offer British industry such financial facilities, during the present crisis at any rate, as German banks have long afforded German industry. Of much more importance is the announcement that the responsible authorities are looking into the questions of revoking or nullifying German patents which stand in the way of certain chemical and other forms of manufacture. The Chambers of Commerce, too, have not been idle, and the chairman and secretary of the Association of Chambers of the United Kingdom have issued the following circular letter:—

> The attention of the Association of the Chambers of the United Kingdom has been drawn to the fact that within the past week a very large number of orders for goods from customers of the British Empire have been cancelled or reduced in volume or their delivery postponed. This is possibly due either to the temporary advance in the price of goods, or uncertainty as to war risks. Both these deterrents to business have been immediately provided for by the Government, and we therefore appeal to traders, both at home and abroad, not only to confirm their orders, but to increase them and advance shipments wherever possible. The Mother Country has a large mass of industrial population who cannot go to the war themselves, but will have to support the dependents of those who have gone. The manufacturers in the Old Country have shown the greatest possible desire to help their employees by giving them partial employment during this time of trial. They cannot succeed in this necessary object if their customers not only suspend orders already placed, but delay payment in any way for goods shipped or to be shipped. If customers could also anticipate their orders they would render real service. The Association is satisfied that it has only to bring these facts to the knowledge of our fellow subjects both at home and abroad to secure that this very practical means of assisting the Mother Country in its difficulties is not overlooked, especially by our kinsmen overseas.

There can be no doubt, indeed, that South Africa, India, the Dominions and even the Crown Colonies can help greatly. Now that German goods are no longer being shipped we may at least expect that some of the business will be placed in the British Empire. Foreign countries, too, will miss their usual German supplies, and in view of the vigorous commercial campaign now inaugurated we can hardly fail to reap the benefit.

Nourse Mines.

In the directors' report for the quarter ended the 30th of June, 1914, it is stated that owing to an improvement in the labour position the tonnage handled was increased, and the tonnage milled was 20,600 tons greater than for the previous quarter; working costs per ton milled were decreased and profits increased by £12,501. Development operations were carried out on an extended scale, resulting in an increase of 1,000 feet over the previous quarter. The expenditure on authorised work for capital account amounted to £332, leaving an estimated sum of £607 to complete the work on hand. The revenue from gold won was £189,116, a value of £1 6s. 6d. per ton milled, and the total working expenditure was £138,581, or a cost of 19s. 5d. per ton milled.

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by Class, Private Tuition, and Correspondence.

SOME 1914 RESULTS:—
MANAGERS - - - January and May - - - ALL Passed.
ELEC. ENGINEERS - February - - - - - - 66% ,,
MECH. ENGINEERS - June (Kimberley Centre) - - ALL ,,
MINE OVERSEERS - - - - - - - Practically ALL ,,
NEARLY 200 SUCCESSES. St. James' Mansions, Eloff Street.

West Rand Consolidated.

Report for the quarter ended 30th June, 1914. Mine. Number of feet driven, sunk and risen, 3,557 feet; footage sampled on reef 1,010 feet; average stoping width, 41 inches; average assay value over stoping width: Payable (465 feet sampled), 10.1 dwts., low grade (545 feet sampled), 2.1 dwts; ore mined, 92,261 tons; less waste ore discarded (14.15 per cent), 13,061 tons; ore sent to mill, 79,2[illegible] tons. Mill. During April 100 stamps and 4 tube mills ran 24.53 days, during May 100 stamps and 4 tube mills ran 24.39 days; during June 100 stamps and 4 tube mills ran 25.15 days. Total running time 74.07 days. Ore crushed (total tonnage), 79,200 tons; duty per stamp per day, 10.69 tons; yield in fine gold, 14,040.564 ozs.; yield per ton, 3.545 dwts. Cyanide works. Sands and slimes treated (equal to 100.10 per cent. of tonnage crushed), 79,516 tons; yield in fine gold, 9,355.054 ozs.; yield per ton treated, 2.353 dwts.; yield per ton (on basis of tonnage milled), 2.362 dwts.; working cost per ton treated, 1s. 7.87d. Total yield. Mill, 14,040.564 ozs. fine gold, 3.545 dwts. per ton milled; cyanide, 9,355.054 ozs. fine gold, 2.362 dwts. per ton milled. Total 23,395.618 ozs. fine gold, 5.907 dwts. per ton milled. Working profit for quarter, £20,[illegible] 1s. 11d., 5s. 2[illegible]d. per ton; revenue, £99,537 1s. 8d., 25s. 1[illegible]d. per ton. Expenditure on capital account. On account of Permanent work, £6,[illegible] 6s. 5d.; [illegible] mine development £[illegible] 1s. 8d.; machinery and plant £[illegible]; [illegible] furniture £35. Total, £8,817 8s. The average development values as shown on the previous page, represent the actual result of sampling, no allowance having been made for any reductions which may subsequently be considered advisable when compiling the ore reserves.

Engineering Notes and News.

NOTES ON TRANSFORMERS.—II.*

Experiences of the Two Rand Power Companies.

[By BERNARD PRICE, Vice President of the S.A.I.E.]

INSULATION.

All the transformers connected to a large system must be designed for withstanding excessive potential strains at times of emergency, and especially so in cases where the transformers are fed through overhead lines in a district, such as this, which is prone to lightning. The surging effects which take place on such systems, whether caused by induced effects from lightning or from other causes, represent a strain on certain portions of the windings which is enormously greater than the normal working strains. The cables, lines, switchgear connections, and, in fact, every portion of the system, other than the windings of apparatus, are readily designed for withstanding momentary effects of these magnitudes, and if an insulator should fail it can be replaced rapidly and with small expense. A winding, however, is more difficult to insulate, and at the same time is very much more difficult and expensive to repair. It is, therefore, obviously sound policy to provide a very liberal margin in designing the insulation of such windings. In my opinion, the keen competition of recent years has tended towards the standardisation of apparatus, which is cut too fine in this if not in other respects. No doubt the purchaser is as much to blame for this as the manufacturer, but my experience has led me to the opinion that it is "penny wise, pound foolish" to endeavour to save a relatively small percentage on initial cost at the risk of even but an occasional failure. Judging by what I saw in the large factories in America two years ago, I believe that this point has been forced home to purchasers and designers when dealing with new designs for pressures of 100,000 volts and over, as I found that a real endeavour was being made to provide adequate insulation between adjacent turns of the coils for transformers working at such pressures. For these pressures the whole of the coils are insulated alike so far as the separation of adjacent turns is concerned, and I believe that this is necessary even for lower pressures, where surging may take place. It is common practice, to rest content with providing extra insulation on a few per cent. of the turns at the incoming ends, but I cannot say that my experience has satisfied me that this is adequate. In my opinion, it would be a good plan if manufacturers were to standardise two classes of product, one for use on large systems and wherever surging is to be expected, and the other for use on systems of smaller size or where conditions are less severe. This would enable the purchaser to obtain apparatus of suitable design for withstanding the mechanical and electrical strains imposed by the conditions of working on a large power scheme, whereas many of the existing standard designs would be quite suitable for the purchaser who has to deal with the very different conditions which obtain on a relatively small scheme, such as a private installation. The difficulty to-day is that even if the purchaser is prepared to pay an enhanced price, the manufacturer has not standardised a design that would meet the specification unless it be, as I have said, a case of some new and special type about to be developed. The cost of maintenance, especially in this and other countries where labour is expensive, will rapidly offset any initial saving in capital accruing from a reduction in the margin of insulation provided.

ROUTINE INSPECTION.

An important point when inspecting transformers is the tightening of all clamping arrangements and connections. The insulating materials used have a tendency to shrink and to become more thoroughly down after a certain period of service, and unless everything is tightened up periodically the coils may become loose, and therefore liable to become displaced at times of short circuit. Again, there is always a certain amount of vibration which tends to slacken the nuts and the connections, and it it most important that all nuts should be locked.

METHODS OF DRYING OUT.

I would mention a system which has been successfully adopted here—namely, that in which heated oil is circulated through the transformer under vacuum. This is a very effective method when dealing with very large transformers, and the rate at which moisture is extracted from the oil provides a ready means of judging as to when the transformer is dry. When using this method we have found that a 12,000 K.V.A. three-phase transformer takes not less than from eight to ten days to thoroughly dry out. I agree with the author that the use of a paper filter press is a very simple and effective method.

INSULATION OF CORE.

A point which did not at one time receive the attention it deserves is the careful and liberal insulation of various portions of the core structure. It is as important to insulate the clamping bolts for the laminations, and the main clamps for the complete core, as it is to insulate the windings, and all such insulation must be of good mechanical design.

INHERENT REGULATION.

The tendency to-day is to design transformers for a much larger internal reactance than formerly. It must be remembered that, whereas close regulation of pressure was a matter of importance in earlier days, when lighting supply for carbon filament lamps formed an important part of the business of most schemes, the permissible fluctuation in pressure on a large power scheme to-day is not less than 10 per cent. in either direction. It would be folly to increase the price of power to all consumers by encumbering such schemes with the increased capital expenditure entailed for maintaining a more constant voltage. The modern power company contracts to give a supply which is satisfactory for power work, and in cases where it is necessary for the consumer to take a supply for lighting purposes he (the consumer) can, at small expense, instal a motor generator or induction regulator for obtaining a more constant voltage. As a result of concentrating a number of huge generating units on one system, it has become necessary to limit the amount of power available under short circuit conditions, and as a fairly wide range of fluctuation of voltage is permissible, the easiest and cheapest means for providing this limitation of power is an increase in the internal impedance of the various items of apparatus of which the system is composed. Modern step up and step-down transformers are, therefore, designed for a regulation of about 5 per cent., and the internal reactance of modern generators is also much larger than was common a few years ago.

WATER-COOLING COILS.

Although the author does not touch on this point in his paper, I would refer to an interesting trouble which we recently experienced at the Robinson Compressor Station. The large 80,000-volt step-down transformers feeding this station from Vereeniging have been provided with iron cooling coils. The water in the pan is, as a rule, about neutral, but as a result of the recent dry seasons some concentration has taken place, and the water has become slightly acid. This water had no general effect upon the cooling-water system, but, owing to an unfortunate defect in manufacture, constrictions existed in the transformer cooling coils which caused a scouring action to take place. This scouring action was sufficient to keep a clean surface on the inside of the tubing, and this surface gradually corroded. The constrictions referred to were the result of defective galvanising which caused lumps of zinc to remain at certain points. A careful inspection failed to show any galvanic action, but it was quite clear that with the normal velocity of flow the piping was protected by a thin film of deposit, whereas with the higher velocity of flow caused by constriction such film could not be maintained. The difficulty was overcome by removing the constrictions. We have also neutralised the acidity of the water by the use of lime so as to prevent corrosion at other points on the cooling system where any velocity at bends and elbows was likely to cause deterioration.

---

*Read before the South African Institution of Engineers.

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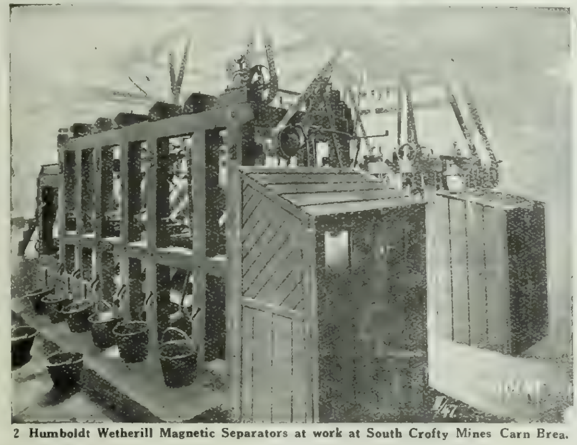

2 Humboldt Wetherill Magnetic Separators at work at South Crofty Mines Carn Brea.

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Finance, Commerce, and Industries.

The White Labour Market.

The Mines Department Labour Report for August shows that eight municipalities in the Transvaal during August approved plans of the estimated value of £82,329 as against £122,314 in July. Nine towns in the Cape Province approved £31,934 worth, Durban £38,967 worth and Bloemfontein £1,955 worth. Public buildings tenders were accepted by the Government to the value of £12,173. Various sectional reports state that in the Cape Peninsula cases of distress have not increased to any considerable extent in industries. Johannesburg miners are on the whole very well employed, though the outlook is not encouraging in the building trades. In engineering and electrical trades the activity is due to efforts to secure a reserve stock. "If transport becomes normal there will be a corresponding drop later on." Pretoria industries are dull to fair with the demand in domestic occupations still in excess of the supply. In the Cape Peninsula engineering is brisk, but other trades generally are dull. In Durban practically all the trades are slack excepting saddlery and harness. No new work is going on.

* * * *

The New Railway.

In the official report on the necessity for building the line from Prieska to Upington, it is stated that the conclusion come to after an inspection of the districts is that the route from Prieska via Prieska Poort and the vicinity of Draghoender to the south bank of the Orange River at Upington should be adopted, and they recommend accordingly for the consideration of Parliament. It will be observed that this route follows approximately the course of the Orange River. It will be easy to build and can be constructed expeditiously. The Commissioners are not able to report that the line is likely to be financially remunerative for many years to come though it will serve a permanently useful purpose and is immediately necessary owing to the conditions of war prevailing. Under these circumstances it is felt that Parliament will prefer to decide how any shortfall in the working of the railway shall be met without any recommendation from the Railway Board. The outstanding features of the work are: Approximate length of line, 150 miles; gauge, 3 ft. 6 in.; estimated cost of construction, £337,500; average cost per mile, £2,250; estimated capital cost, including £201 per mile for rolling stock, £367,650; ruling grade (compensated for curves), 1 in 66; curves minimum radius), 660 feet; weight of rails, 60 lb. second-hand.

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* * * *

"S.A. Mining Journal" Exchange.

With the Stock Exchange closed, it has been represented to us that the time is opportune to offer facilities in our advertising columns for the purchase and sale of securities for cash. No speculative dealings, of course, are ever possible through the *S.A. Mining Journal* Exchange. But sellers who desire money for securities they hold, and buyers who desire securities at the present low prices, and are prepared to pay cash can usefully avail themselves of the *S.A. Mining Journal* Exchange. Write stating name of stock or share, the amount and the price required, together with a postal order for 5s. for each item announced, with a stamped addressed envelope. Announcements should reach this office by 5 p.m. on Thursday of each week to ensure publication in that week's issue.

* * * *

S.A. Manufacturers.

We gladly give prominence to the following appeal, signed by the Secretary of the S.A.N. Union "In the efforts which Great Britain is making to increase the volume of her manufacturing trade the development of all parts of the Empire is necessarily included. The more production within the Empire is stimulated the more powerful will British trade become, with an ever expanding demand for British machinery and for British capital. Obviously, therefore, it is the duty and advantage of South Africa to do her share by producing within her borders all those articles for the growth and manufacture of which she has natural opportunities. We have already a considerable number of factories in different parts of the Union and there is a growing desire on the part of the Government and of business houses to support them. But it is by no means easy to ascertain readily what firms are able to turn out goods in commercial quantities. The names of a certain number are known to most business men, but there are others who appear to be satisfied with a local reputation. The S.A. National Union feels that the time has arrived when every South African manufacturer should bring himself more prominently before the notice of the South African public. In order to make that possible firms in South Africa producing goods in commercial quantities are asked to send their names and addresses, together with a list of the articles they make, to the Secretary, South African National Union, 62, Old Market Buildings, Johannesburg. When this information is supplied it is intended to issue a pamphlet containing such details as are necessary to the commercial man who is willing to purchase locally-made goods on a generous scale. It is urged in this connection that a combination of manufacturers dealing in small lines—a South African J. T. Morton in short—would greatly facilitate business in local products. The idea is put forward by the S.A.N.U. as one worthy of earnest consideration. There is every expectation that the output of the South African farmer will largely increase in the near future. The South African manufacturer will be equally fortunate if he makes himself better known at this stage, and combines as suggested."

Companies Registered.

The following is a list of companies registered during August, 1914.

Julius Kemp & Company, Ltd., Carlton Hotel Buildings, Commissioner Street, Johannesburg; capital £2,000.

Husfeldt, Limited, Stand No. 4, Main Road, Randfontein; capital £3,000.

The Mineral and Trust Company, Ltd., No 15 Albert Buildings, Eloff Street, Johannesburg; capital £500.

Patel, Limited, 500 Boom Street, Asiatic Bazaar, Pretoria; capital £2,000.

Gani Mahomed, Limited, Erf No. 34, Market Street, Pietersburg; capital £1,000.

Wylie's Farmers' Dairy, Ltd., No. 39 De Korte Street, Braamfontein, Johannesburg; capital £7,500.

Palmer's Supply Stores, Ltd., Stand No. 505, corner Church and Main Streets, Kenilworth, Johannesburg; capital £500.

Gurneys, Limited, Store Bros.' Buildings, No. 27 Eloff Street, Johannesburg; capital £5,000.

The Pretoria Retailers' Council, 214 St. Andries Street, Pretoria; capital £20.

The Norwood Land and Investment Co., Ltd., No. 7 Natal Bank Chambers (1st Floor), opposite New Town Hall, Market Street, Johannesburg; capital £1,000.

Hanover Rubber Co., Ltd., 51 53 Exploration Buildings, Commissioner Street, Johannesburg; capital £12,500.

Rhone Tributes, Ltd., No. 45 Sacke's Buildings, Joubert Street, Johannesburg; capital £600.

The Pala Pala Gold Mines, Ltd., 21 Royal Chambers, Simmonds Street, Johannesburg; capital £500.

W. T. Forshaw, Ltd., 205 Anderson Street, Johannesburg; capital £1,000

Additions and Alterations.

Montrose Diamond Mining, Limited, Johannesburg.
Leydsdorp Mica, Limited, Johannesburg.

Increases of Capital.

New Kleinfontein Co., Ltd., Johannesburg; increased from £1.151.540 to £1,300,000.

Pretoria Industrial Co-operative Co., Ltd., Pretoria; increased from £1,500 to £2,000.

Torre Do Valle & Co., Ltd., Johannesburg; increased from £5,000 to £50,000.

New Rand, Ltd., Johannesburg; increased from £170,751 to £180,751.

Property Investment Co., Ltd., Johannesburg; increased from £5,000 to £20,000.

Consort Reduction Works, Ltd., Barberton; increased from £16,000 to £20,000.

New Rand, Limited.

The New Rand, Ltd., is to increase its nominal capital from £250,000 to £300,000.

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NOTICE is hereby given that an Interim Dividend of Twenty five per cent (Five shillings per share) has been declared by the Board for the half-year ending 30th September, 1914.

This Dividend will be payable to Shareholders (other than German or Austrian subjects) registered in the Books of the Company at the close of business on 30th September, 1914, and to holders (other than German or Austrian subjects) of Coupon No. 23 attached to Share Warrants.

The Transfer Books of the Company will be closed from the 1st to the 7th October, 1914, both days inclusive.

The Dividend will be payable to South African Registered Shareholders (other than German or Austrian subjects) from the Head Office, Johannesburg, and to European Shareholders (other than German or Austrian subjects) from the London Office, 1, London Wall Buildings, London Wall, E.C., on or about the 4th November, 1914.

Holders of Share Warrants (other than German or Austrian subjects) are informed that they will receive payment of the Dividend on presentation of Coupon No. 23 at the London Office of the Company, or at the Credit Mobilier Francais, 30 and 32, Rue Taitbout, Paris.

Coupons must be left four clear days for examination, and will be payable at any time on or after the 4th November, 1914.

By order of the Board,
RAND MINES, LIMITED
Secretaries
per E. CALVERT,
Asst. Secretary.

Head Office,
The Corner House,
Johannesburg,
8th September, 1914.

THE SOUTH AFRICAN

Mining Journal,

WITH WHICH IS INCORPORATED

South African Mines, Commerce and Industries.

ESTABLISHED 1891.

VOL. XXIV., PART I.] SEPTEMBER 26, 1914. [No. 1200.

HEAD OFFICE: 176-180, Stock Exchange Buildings, Fox Street (2nd Floor), Johannesburg, Union of South Africa.

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NOTICE.—The postage of this issue of the *S.A. Mining Journal* is: South Africa, ½d. All other parts, 1d.

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Notes and News.

Business as Usual. At a meeting of editors of trade journals representing many branches of British industry, held in London the other day, great faith in the present commercial position was expressed, but patience, confidence and reasonable sacrifice were deemed essential if we were to take full advantage of the present very bright prospects. In the recommendations arrived at by this meeting the public were urged to pay prompt cash for their present requirements: retailers were appealed to not to take unfair advantage of the moratorium; manufacturers were asked to keep up their production; and banks were desired to afford all possible support to both wholesale and retailer.

* * * *

Cyanide Supply. The demand for cyanide has grown largely since its introduction into the gold mining of the Rand and the silver mining of Mexico, and the output may be roughly stated as 10,000 to 12,000 tons a year. The present price is 7d. per pound, it being kept at this low figure in order to prevent further development of certain synthetic processes, which cannot compete successfully at less than 8d. or 9d. per pound. To the expected large production from gasworks should the price rise above 8d. per pound, we do not attach much importance. Though not the only producers, the two firms which really count in the cyanide manufacture are the cyanide company of Scotland, and the Dessau Company, of Germany, which each hold successful patented processes, the former manufacturing from ammonia and the latter from the waste beet sugar residues, a source of nitrogen which is abundant in Germany. Of the South African imports of cyanide about three-fourths come from Germany and one-fourth from Great Britain, though this ratio is not on a par with the relative outputs of the two countries.

* * * *

Coded Messages and Export Trade. At a moment when British firms are making exceptional efforts to do business with the Colonies, it is, to put it mildly, a little hard that they should be placed so greatly at a disadvantage by the ban that the censor has had to put on coded messages. The necessity for extreme caution few will question at a time such as this, but our industrial and commercial firms which have for years made a regular practice of conducting considerable business between the Colonies and England in coded form find themselves faced with very big expense and loss of secrecy through sending messages in plain English, or possible delay if they adopt the deferred message rate. We are not surprised, now that the British Press is devoting almost as much space to the Trade War as to the War itself, to see letters in the *Times* from several firms who feel the hardship very keenly. An East India merchant urges the reduction of cable charges for plain word telegrams, permission to use registered telegraphic addresses, and permission amongst British subjects to use codes to and from the East, as measures that would be of great assistance in "restarting the whole of commerce," so that "these money-making machines" can be utilised as quickly as possible. A firm of Anglo-African exporters strongly appeals to the authorities to try and find some other way of preserving a strict censorship without prohibiting commercial code messages. It lays stress upon the importance which business firms attach to secrecy, and mentions the possibility of an ordinary clerk in a cable company's office in a far-off market disclosing the contents of a plain message to his personal acquaintances or the competitors of the sender. The proposition is advanced that British firms of good standing and unblemished reputations should be allowed to continue coding their cablegrams, if necessary under a guarantee given by, say, two other similar firms or bankers. He suggests that "a signed literal translation of each message might accompany it for the censor's information on this side, and replies received in code might be decoded by the addressees in the censor's office before delivery. The code would, of course, be produced whenever required, but the multiplicity of private codes would make in impracticable to file a copy of each in the censor's office." We have no doubt that these suggestions will be given careful consideration by the authorities.

* * * *

Property in War.

In order to properly understand the practice of civilised nations in respect of personal property in war we have to go as far back as to the signature by King John of Magna Charta. One of the most remarkable provisions of that precocious offspring of statesmanlike brains in England declares that on the outbreak of war "foreign merchants in the country shall be attached, without harm of body or goods, until it is known how English merchants are treated by the enemy. And if our merchants be safe and well-treated there then it shall be so with us." The humane and enlightened principle so sanctioned and legalised by the English barons was adopted in effect by some of the most prominent European nations in the Middle Ages. Thus we have an ordinance made by Charles V. of France which provides that "Englishmen who shall be in France at the time of a declaration of war shall be at liberty to depart freely, with their effects." A still more definite and generous concession to the mercantile community and to the friends of civilization was made in the reign of the great warrior King Edward III. For the Statute of Staples, passed in the 27th year of his reign, enacts that "foreign merchants residing in England when war commenced shall have forty days to depart, with their goods, and if prevented by accident shall have forty more days, with liberty to sell their goods." In the reign of Henry V. it was enacted that neither the persons nor the goods should be seized of Frenchment who had come to England before the war. The liability of personal property afloat differs considerably from the liability of that which is on land; and the practice of the more civilised nations with regard to it is not so well settled or so uniform. In most cases the rules established are enforced by prize courts; and they purport to be gathered from the decisions which have been pronounced therein. The whole subject is too wide to be discussed in a single paragraph. We are in South Africa, of course, more interested in this branch of the law than any other; and the writers on international law found their arguments and conclusions mainly upon the views announced by judges presiding over the English Courts from time to time.

* * * *

Working Costs and the Life Question.

The report of the Inspector of Mines, Germiston, for December, contains some very interesting details with reference to the grade of ore being mined at that time in a portion of the Knights Deep. Reference was made to a stope 22 feet in height, the value of the rock over which was only 2·4 dwts. or about 10s. The company was working the rock at a profit, for the actual cost of rock mined, hauled, and treated per ton was 7s. 9d. from that particular stope. This may be a solitary instance, and mining 2·4 dwts. rock may be criticized, but the above results give some cause for thought. The Simmer and Jack Mine again was working at the cost of about 11s. at the same time, a figure remarkable in itself, but which was considered might still be decreased in future. "There figures are given," says the Secretary for Mines, in his last annual report, "as showing in regard to the question of the life of existing mines on the Rand which has been so much discussed in recent months, that the last word has not yet been said; and conclusions formed by calculations on existing general working costs are likely to prove premature."

* * * *

European Oil Resources.

Responsible authorities maintain that the oil resources of the Empire are adequate to our naval and commercial interests for a long time to come, while those of Germany are limited. A comparison of the production of crude oil in the four European oil-producing countries either directly or indirectly concerned in the great struggle entered upon is worth notice. Mr. J. T. Smith, in *Oil News*, states that in 1913 Russia produced 9,325,894 tons, Roumania 1,885,384 tons, Austria (Galicia) 1,087 286 tons, and Germany 130,000 tons (estimated). Remarking on each country, he shows that Russia has by far the largest production to the extent of exceeding that of the other three countries put together. The increase in the Grosny field and the Ural Emba district has counterbalanced her decline in the Baku district. Latest advices in respect of the Baku strike of workmen, which began early in June, were that partial return to work had been effected, and pressure was being exercised to create normal conditions. The position of Roumania is undefined, mobilisation having considerable effect upon the country's production. As regards Galicia, the large field of Boryslaw-Tustanowice, in and near which 80 to 90 per cent. of the total production is concentrated, must suffer from mobilisation, but the Austrian Government will try to prevent undue shrinkage in workmen. The Russian frontier is in short distance of the field. Except for her own moderate output and fuel oil from coal tar Germany relies upon the United States, Roumania and Galicia for her sources of supplies, and must therefore suffer severely from the Russian occupation of the latter.

* * * *

Mining at Mount Anderson.

In regard to mining in the Mount Anderson district, Claim Inspector Schroeder, in his last annual report, writes:—"At Mount Anderson the chief drawback to the more rapid development of this part of the Sabie Division is the extremely poor class of claimowner who has somehow managed to acquire most of the ground through being first in the field. Many of them can barely afford the ordinary necessities of life, and are unable to employ labour of any kind to open up the leaders or to work the alluvial; others again are simply 'sitting tight' on their ground, consequently very little genuine prospecting is done, although a good deal of fossicking is going on. They are all quite prepared to sell, usually at a ridiculous figure, and are patiently waiting for some one with cash to come along and buy them out. Naturally those investors who have somewhat late in the day begun to realize the value of the ground are averse to paying a large cash figure for unproven ground. Excepting Hoppes alluvial, the Donovan Brothers are the only ones who have spent money on their claims, with the result that within a few months they have been fortunate enough to get out over 1,000 ounces of gold out of their leaders. As soon as they are able to rig up a small reduction plant they will declare an output, and from the amount of gold they have on hand it should be a substantial one. They have already returned a little gold, but this is practically pure nuggety gold which did not require treatment."

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A Modern Cornish Tin Plant.

At the Hobb's Hill mine, near St. Neots, Cornwall, where the production of tin commenced recently, there are no buddles or frames such as are to be seen on other Cornish tin dressing floors. The plant at this mine comprises four Nissen stamps, Kirk-Levalle classifiers, James' sand tables, cone thickeners, and James' slime tables. Mr. David Draper, who is well known in South Africa, is manager of the Hobb's Hill.

* * * *

Dividends: A Warning.

The Board of Trade has issued a warning to all joint stock companies and their officers that—(1) No dividends or interest declared or becoming due after the outbreak of war should be paid during the war to or in accordance with instructions from any person resident in enemy territory. Such dividends or interest should be paid into a separate account at a bank to be disposed of after the conclusion of the war. (2) No transfer of any shares or debentures from any person resident in enemy territory should be registered during the war.

* * * *

Base Metal Prices.

The Committee of the London Metal Exchange in mail week fixed the price of best selected copper once more at £59½—£60½ per ton. The average prices per ton of various metals for the month of August were announced as:—Electrolytic copper, £62 10s.; spelter (zinc), £29; and lead, £20 9s. 9d. During July electrolytic copper fluctuated between £63 15s. and £59 15s., closing at the latter price; spelter between £21 15s. and £21 10s., closing midway between the two prices; and lead between £19 17s. 6d. and

£18 2s. 6d., closing at £18 15s. The average quotations of all three metals last month were consequently well above the level ruling on the eve of the war.

* * * *

Trading with Alien Enemies.

One of the most intricate problems attaching to a state of war in modern times is the scope and definition of the term alien enemy. Until the outbreak of this war there existed a considerable school holding the view that the complex network of international trade, and the vast commercial interests that would thus become involved, would in themselves be an overpowering factor making for peace. This view has been rudely shattered by the Potsdam *clique*, who have thrown over the whole future of German commerce in favour of an insensate appeal to arms. The result has been to place South Africa as well as the United Kingdom in a somewhat difficult position with regard to certain persons domiciled among us, and enjoying all the rights and privileges of British citizens, carrying on, it may be, a profitable trade in competition with ourselves, and yet in some cases, by both birth and sympathy, to be classed among our alien enemies. The law, as it seems to stand, is very obscure regarding the status of enemy subjects trading in our midst. From the strictly national point of view the mere fact of trading with an alien may be a legal and even criminal offence amounting to treason. The Royal Proclamation prohibiting trading with Germany, however, provides that commercial transactions with Germans resident in this country provided they are not treasonable, and, but for the existence of the state of war, lawful, are permitted to continue; but according to the *Law Journal* it is not clear to what extent such dealings may legally be carried on, and certainly they would be illegal if the result were to enable an alien enemy to transmit either money or goods to his own country. In practice it must be extremely difficult to lay down any general rule upon this point. Theoretically, any dealings which add to the wealth of an alien enemy increase the potential danger of his residence amongst us. A still more important point was raised in the House of Commons when Mr. J. M. Henderson asked the President of the Board of Trade whether it was proposed to grant licences to trade to companies recently registered in England the shares of which were held by Germans living in Germany, and which companies were merely a change of name from the original German firms or companies, the ownership being the same—viz., German. Mr. Runciman replied that enquiries were being made into this matter, which would have very earnest consideration, and pending his decision it would perhaps be well to suspend any remarks upon the matter, beyond stating that our legal contemporary, the *Law Times*, expresses the emphatic opinion that a corporation has no nationality, and no fixed domicile. It may have a head office in several countries. It may be managed in one and carry on business in another. Incorporation is mere recognition, and involves no responsibility or control. As the *Law Times* says, the position of an enemy subject in the British Empire may be a very delicate one. His property may be confiscable, his contracts may be void, and the courts may be closed to him; but if he is here by the express or tacit leave of the Crown it is difficult to see how the ordinary privileges of traders can be denied him. The whole matter plainly bristles with difficulties.

* * * *

Union Mineral Statistics.

The statistics of the Union Department of Mines and Industries for the month of August show that the total white men employed in gold mines was 22,228. There were 118 reef and alluvial diggers and 46 on metallurgical and tailings works. In the same month the Witwatersrand gold mines employed 171,379 coloured men; other districts 12,135; and other Provinces 57. There were 959 coloured persons at reef and alluvial diggings and 322 on metallurgical and tailings works. Of the white miners engaged in the Witwatersrand, 20,539 were on producing and 771 on non-producing mines. The number of whites in service in the diamond mines is returned at 3,628. The coloured labour force was 12,080. On coal mines the figures were 1,375 and 26,970 respectively, and on bare mineral mines 466 and 5,316 . Lime and flint works employed 67 whites and 1,096 coloured. The output of silver was 75,732·511 fine ounces, of a value of £8,504. The coal produced was 785,291 tons, value £209,036, and the value of base minerals other than coal was £37,360.

TOPICS OF THE WEEK.

THE OUTLOOK.

After nearly two months of war the position as far as South Africa is concerned may be written down as satisfactory. The mining industry of the Rand pursues its normal course, business generally has begun to recover from the first sudden shock, and the whole tendency of events is hopeful, healthy and sound. Setbacks, of course, we have had. To have escaped them would be surprising. Some naval reverses have been sustained, and the weak spots in our armour revealed. Disaffection in this country has unexpectedly raised its ugly head—only, however, to be stamped upon promptly and effectually. In the face of difficulties, the Government has shown wonderful strength, firmness and decision. By the master stroke of declaring his intention to command the Union forces in person, General Botha has wrought confusion in the camp of the Union's enemies, and performed a great and signal national service. General Smuts has likewise risen nobly to the occasion; and the country may well rejoice in the splendid and successful conduct of its affairs by the Government in the face of the doubt, hesitation and trials of the past two months. With business and industry all continues to go well. While not attempting to forecast the effects of a prolongation of the war on financial conditions, authorities appear to be agreed that the storm is being weathered. A passage in the annual report of the Johannesburg Consolidated Investment Company, printed in this issue, puts the whole matter in a nutshell. At the annual meeting of the Transvaal Gold Mining Estates a few days ago, the Chairman also had a cheery, confidence-giving word to say in regard to the outlook. Next Monday at the quarterly meeting of the Chamber of Mines, we look to receive from the President a further message of encouragement; and doubtless Mr. Wallers will take the opportunity to bring his review of the position of the Rand down to date. With every confidence, therefore, in the ability of our Government and the leaders of the industry to guide affairs through the shoals and quicksands of the time, we may be going on. Time is with us; and right and faith and confidence in the ability of the Empire, and this part with which we are mainly concerned, inevitably to win through.

WAR AND THE ENGINEERING TRADE.

Second only to interest in the war itself is the attention everywhere being given to the progress of the trade war between Great Britain and Germany for the possession of our markets. Reports that are coming to hand from the great engineering centres of the United Kingdom give little occasion for gloom. It was inevitable that so great a shock should overwhelm most things for a time, but after recovery from the first effects those responsible for business and industry have calmly and confidently endeavoured to accommodate themselves to the altered state of affairs, making necessary adjustments here and there. From some of the manufacturing districts comes the news that factories are already receiving business from both home and abroad which would not have come to them a month ago. The feeling seems to be fairly general that as soon as matters become more settled, and insurance and freight rates are lowered, British firms will have a very busy time. From various directions we are receiving inquiries asking where it is possible to obtain in England, the U.S.A., or in other neutral countries particular lines of manufactures previously obtained from Germany. We shall do our best, both privately and by publicity, to assist to bring together the willing manufacturer and the seeking customer—that is one of the great objects of our existence, as a paper, and always has been so. We believe that the existence of this inquiring spirit will prove to the trade, if any proof were necessary, that at this stage it is more important than ever that the manufacturing ability and resources of the British engineering industry should be given the fullest possible publicity, some emphasis being laid upon any particular capacity for handling new and special lines. Trade and technical journals have their own trials at this time. Mr.

Thomas Russell, the president of the Society of Advertisement Consultants, said the other day that the slump in advertising was due to panic. He expressed the view that the only way to get confidence back was to advertise, and everybody who ceased advertising was delaying the return to the normal. Engineering firms by keeping going as fully as possible are, as we have already stated, assisting the Empire, but they are also in the position to help themselves in some directions by availing themselves of newly-opened opportunities such as we have mentioned above. This should be a powerful inducement to them to keep themselves in the full glare of the footlights.

THE IMPORTANCE OF THE MINING INDUSTRY.

Striking testimony is afforded to the importance of the mining industry in the annual report of the Secretary for Mines, issued a few days ago. A perusal of the general figures for 1913 shows that the mining industry as a whole maintains its position as the largest contributor to the exports of the country. The industrial disturbances of July, resulting in a diminution in the number of natives employed on the Witwatersrand for the remaining six months of the year, caused a fall in the total output of gold, as compared with 1912, to the extent of about £1,320,000, with a consequent slight falling off in the production of silver. Diamonds, on the other hand, show an improvement over 1912 of £1,328,318, due largely to the increase in the price, while coal also shows an increase of value of about £240,000 over the previous year. There is a slight falling off in copper exported, which will probably be continued as years go on, as the Namaqualand mines become worked out; the output of the northern Transvaal will, however, tend to meet the deficiency in Namaqualand. The improvement in the value of tin exported, however, balances any loss in copper. As regards other general minerals, there is not any serious variation. The total mineral export for the year is estimated by the Secretary for Mines at £51,854,497, while the total exports of the Union for the year amounted to £66,659,552. The difference between the amount of mineral exported and the amount produced is largely in coal locally consumed, and in certain consignments of other minerals not yet exported on the last day of the year. The importance of the mineral industry to the country is shown in the fact that the total mineral export was 77·79 per cent. of the total exports of the Union. It is difficult to show exactly what percentage of the value of the total mineral output is spent within the Union itself. Complaints are frequently made that the mining industry is exploiting a wasting asset of the country, for which the country is getting no return. Such statements, Mr. Warington Smyth shows, can surely only be made under a misconception. The percentage actually going to investors who have lent us the capital to open up our mines is, when examined, a comparatively small portion of the total won from the earth. Taking the Witwatersrand gold mines, out of the total output of just under $35\frac{3}{4}$ millions, the following amounts were paid in wages and salaries in 1913:—Whites, £7,537,101; Coloured, £5,340,661; and in stores, £10,128,800; while over £1,000,000 was paid in direct taxation to the Government. Thus of the gold exported from the Rand 21 per cent. comes back and is paid out to whites in the employ of the mining companies in salaries and wages, and 14·9 per cent. to coloured employees, while a further 28·3 per cent. goes in necessary stores, a total of 64 per cent. or over twenty-three millions. The amount actually going in dividends to those who have put up the money for the development of the mining industry amounted to £8,205,200 or 22·9 per cent. of the total output. It is generally admitted that Johannesburg and the other townships on the Witwatersrand exist by reason of the mines, and of the distribution of money which flows from them. Besides the actual total number of employees directly supported on the mines there is the white population of the Witwatersrand numbering about 170,000 and an estimated native population of a further 50,000, only a few score of whom would have been on the Witwatersrand had it not been for the mines. It is estimated that some £42,000,000 have been invested in land and buildings on the Witwatersrand, apart from the money invested in the mining industry. In the coal industry, the capital for which has been largely put up in this country, hardly any dividends have been paid in the past, the whole of the value of the output going to working costs and being spent in wages, stores, etc., in the country. In the diamond industry, while a larger amount has gone to the investors the amount spent in the country is a very important contribution to the prosperity of the districts in which the mines are situated. Taking the mining industry in all, it distributes nearly £20,000,000 a year in wages alone within the Union. In summing up his remarks on the general outlook, Mr. Warington Smyth writes:—"Taking it all in all the year has been a dull one in mining, so far as new ventures are concerned. Small excitements were caused by the diamond rush at Killarney and by the alluvial gold discovery near Mount Anderson in the Pilgrims Rest district. The former proved disappointing to the majority of diggers who migrated there. The latter has more indications of value, but the number of failures will no doubt, as is usual in such cases, far outnumber the number of successes. Generally speaking, there has been but little new enterprise, and it is only possible to connect this with the shyness of capital. The development of our oil shales, of our coalfields, of our iron ore deposits, as well as of the gold areas on the eastern Rand offer future fields for investment, and are certain sooner or later to claim their share of available capital. The Ammonia Company in Natal is a pioneer in a class of industry which is likely to develop in the future of the Union. The utilization of the by-products from coal and the production of fertilizers are likely to be of increasing importance in this country. It is a serious question how far the inflow of capital, so necessary for development in a new country, will be resumed until stability of industrial conditions is further assured."

Stock Exchange Outlook.

Writing on the Stock Exchange problem, our London correspondent says:—"There is yet no sign of the reopening of the Stock Exchange. For the sake of the general business of the country, and to facilitate the issue of the new loan which the Government will undoubtedly have to raise to meet war expenditure, it is, of course, highly desirable that business should be resumed. Apart, however, from the present critical phase of the war—for it would not do to reopen until the victory of the Allies was practically assured—there are several important internal difficulties to be coped with before it is safe to officially open the House. The first is the question of bank loans on the security of stocks. If the market opened weak the margins on these would be insufficient, and forced sales to repay the advances would precipitate a slump which would inflict heavy losses not only on the members of the Exchange, but on the banks themselves. Some form of Government guarantee to obviate this danger is being spoken of. Then there is the 'open' account carried over from end July, on which very heavy differences will have to be met, more especially on the part of those brokers in London who have been doing a large business for clients in Germany, from whom there is no hope, meantime at least, of receiving remittances. The impossibility of getting money from Germany would no doubt involve failures of a very important kind. It is being argued that losses incurred in this way are the direct outcome of the war, and should be considered as part of the war expenses, and that therefore, for the benefit of the country as a whole, the Government should come to the rescue of the sufferers in order to prevent the failures which would otherwise occur and doubtless cause losses to many others besides those who have actually engaged in foreign business."

POSITION AND PROSPECTS OF THE NEW MODDERFONTEIN.

"A Decided Improvement" Shown—Reduced Working Costs, Increased Profits, and "Greatly Strengthened" Ore Reserves.

SHAREHOLDERS in the New Modder will be presented with a very gratifying statement of affairs at the forthcoming annual general meeting on November 16th. For the most succinct summary of the results of the year ended June 30 last, we turn to the report of the consulting engineer, Mr. Stuart Martin. His report shows that the main features of the year's work, compared with the previous two years, are as follows:—

	Year ending 30th June, 1912.	Year ending 30th June, 1313.	Year ending 20th June, 1914.
Tons milled	585,900	565,400	510,300
Yield per ton milled ...	34s. 6d.	39s. 7d.	38s. 10d.
Costs per ton milled ...	18s. 8d.	19s. 11d	16s. 11d.
Profit realised	£468,788	£559,243	£559,487
Net payable ore reserve (tons)	3,900,000	4,351,000	5,913,700
Average value	34s. 0d.	34s. 5d.	35s. 3d.

The payable ore developed for the year amounted to 1,990,390 tons of an average estimated value of 38s. 7d. per ton. Mr. Martin says:—

The year's operations again show a decided improvement as compared with the years immediately preceding. The profit realised shows a small increase in spite of the scale of operations being limited for the greater part of the year; working costs show a notable decrease, and the ore reserve position has been greatly strengthened by an increase in tonnage and improvement in value. For the first eight months, the average tonnage milled per month was only 38,000 tons, whilst for the last four months the plant was operated nearly to its full capacity of 52,500 tons a month. The two industrial disturbances in July, 1913, and January, 1914, and a severe shortage of native labour were responsible for the restricted scale of operations in the first period. In the earlier part of the year the value of the ore mined was above the average grade of the ore reserve, publishd June, 1913, but as the tonnage milled increased, a grade more in accordance with the general average was dealt with, the yield for the year showing a decrease of 9d. per ton milled as compared with 1913. The value of the ore mined during the year has been more than balanced by the quality of the year's development, which has been excellent. It is gratifying to call attention to the fact that working costs showed a steady decrease practically month by month for the whole year, and for the last four months were well under 16s. per ton milled. The remodelling of the systems of working the mine and handling ore, which has been in progress and has involved an amount of extraordinary expenditure in the past two years, was to a large extent completed during the year, and has clearly been justified, inasmuch as it has become possible to operate the plant to its full capacity with a much smaller labour force and at a lower cost. For the month of June, 1914, as for the greater part of the year, practically the whole of the ore stoped was broken by rock drills. It was possible in this month to keep the mill supplied to its full capacity, after elimination of 10 per cent. of the ore mined as waste rock, with a labour force of 2,603 natives. In view, however, of the narrow width of the reefs mined and the large amount of barren intermediate waste partings that have to be broken in the operation of stoping, the percentage of waste rock sorted out cannot yet be regarded as sufficient, and the policy is to gradually increase this figure by sorting out as much as possible underground and improving facilities on the surface. The success of this policy is dependent on an increased labour force to provide a larger quantity of ore. Granted this, there will be an improvement of the value of the ore sent to the mill and this will be greater than the increase in working costs which will follow. A policy of closer sorting will also enable the company to deal at a profit with upper leaders. not included in the ore reserve. The development footage for the year totalled 14,527 feet, the exposed ore amounting to 1,990,390 tons of an average value of 9·2 dwts. or 38s. 7d. per ton. Several important connections were accomplished; thus the No. 12 incline was coupled up with the circular shaft, and the 8th level main haulage road completed. Development can now be carried forward rapidly from a number of points of attack, and the flexibility of the underground haulage system will greatly facilitate ore transport. The greater portion of the ore developed for the year was on the eighth, ninth and tenth levels in the eastern section of the mine. Good progress has been made on the 1st and 2nd levels from the circular shaft, where values disclosed have on the whole been good; on the east side poor values were shown for some distance, but recently improved results have been obtained. The western drives have consistently disclosed payable ore. During the current year a large area of ground should be opened up in the neighbourhood of this shaft. Its permanent equipment is well in hand, both underground and on the surface. Large underground ore bins have been cut between the 1st and 2nd levels, ensuring an ample reserve capacity. The excavations for the main pumping plant are also proceeding satisfactorily, and, taken generally, the lay-out of this section is planned on lines which should give good results. On the surface a fine steel headgear is in course of erection, together with foundations and buildings for power and hoisting plant. The payable ore reserve has been re-measured and re-valued as at June 30th, 1914, and is as follows:—

	Block Ore.				Shaft and Boundary Pillars.				Total.			
		Value.				Value.				Value.		
	Tons.	Dwts.	s.	d.	Tons.	Dwts.	s.	d.	Tons.	Dwts.	s.	d.
Main Reef	5,800,700	8·4	35	3	410,800	7·1	29	10	6,211,500	8·4	35	3
South Reef	113,000	5·8	24	4	10,000	6·7	28	2	123,000	5·9	24	9
Tls. & avgs	5,913,700	8·4	35	3	420 800	7·1	29	10	6,334,500	8·4	35	3

The above figures are based on stoping widths averaging 63 inches in the Main Reef and 58 inches in the South Reef. Compared with the previous year there is shown an increase of 1,787,500 tons, and an improvement in value of ·3 dwt. The ore reserve is sufficient to supply the existing reduction plant for nine years. In addition to the ore in reserve, there are standing developed in the mine 412,150 tons of an average value of 3·9 dwts., consisting of developed blocks of a value lying between 3·5 dwts. and 4·2 dwts., the present pay limit. The expenditure of £69,247 on capital account has been chiefly in connection with the development and permanent equipment at the circular shaft, as detailed in the manager's report. Exclusive of the cost of any further excess development, the completion of the equipment of the circular shaft will involve a further expenditure of some £112,000, the most important items being for compressor plant and winding engine, together with the main underground pumping plant. Complete plans and estimates are in readiness to proceed with the ordering and erection of plant of an additional capacity of 40,000 tons a month, to be erected as a separate unit at the circular shaft, when circumstances warrant. Although operations for the past year have been successful, taking all circumstances into account, it will be clear that with the large and valuable ore reserves in hand, the full potentialities of this mine have not yet been attained; apart from the probability of increasing the producing capacity of the mine by additional reduction works at the circular shaft, the existing plant, run continuously at its full capacity, is capable of yielding higher profit. Granted a fair labour supply the prospects for the future of this mine have never been brighter, particularly as this company's neighbours, the Modderfontein B. Gold Mines, Ltd., on the east, the Modderfontein Deep Levels, Ltd., to the south, and the Van Ryn Deep, Ltd., on the west, are disclosing unusually good ore as their development approaches the New Modderfontein boundaries. The past year's work reflects great credit on the manager and his staff.

The manager, Mr. E. Miles Shaip, in the course of his annual report, writes as follows:—

Operations for the year ending 30th June, 1914, resulted in a profit of £559,487, an increase of £244 over the previous year, though the yield per ton was 9d. less. The tonnage milled (55,100 tons less than the year preceding) was greatly affected by the strikes and consequent falling off of native labour, and but for this would have shown a considerable improvement. The average number of coloured labourers in service for the year to June, 1913, was 3,830 and for the year under review 2,357. Working costs show a decrease of 3s. per ton milled over the 12 months, and this is due principally to the carrying out of a fixed policy of stoping by machines and of equipping the mine with labour saving devices, such as stope tracks, haulages, etc., which has enabled it, with a very decreased number of boys, to supply the metallurgical works up to their capacity during the last few months. Development in the eastern section of the mine has been steadily carried on and is reflected in the improved position of the ore reserves (Main Reef) which now stand at the very satisfactory figure of 6,211,000 tons at 8·4 dwts. The very important connections of the main haulage crosscut to No. 12 shaft and the incline raise from the circular shaft to No. 12 shaft were correctly accomplished. The latter connection has made it possible to open up more development faces, which are being steadily pushed on. Also the development at the bottom of the circular shaft is being carried on with all speed; ore bins, sumps and pump station are well in hand. The total length of the No. 12 incline shaft from the surface to the crosscut from the circular shaft is 5,271 feet and that of the main haulage level from No. 2 to No. 12 is 5,940 feet. On the surface at the circular shaft, the stone work for raising the collar of the shaft, the foundations for winging engine, compressors and for the house are finished, also that of the surface ore bin. The new headgear and engine house are in course of erection and the transformer house nearing completion. I have much pleasure in acknowledging the willing and efficient support received from my staff.

Pilgrims Rest Mining Activity.

During the year 11 batteries were crushing in the Sabie district, representing 85 gravity stamps of an average of 1,000 lb. per stamp, giving a yield of 18,300 ounces fine gold, amounting to roughly £205,000, exclusive of alluvial gold. The value of the alluvial gold is approximately £4,500, out of which one partnership alone recovered 900 ounces, worth £3,800, from their claims near Mount Anderson.

THE YEAR WITH THE NOURSE MINES.

Operations Restricted by "Erratic and Insufficient Supply of Native Labour"—Praiseworthy Results in "Difficult and Trying Circumstances."

THE year ended June 30 last was a "difficult and trying" one for the Nourse Mines. Summing up and reviewing the work of the year, the consulting engineer, Mr. Stuart Martin writes:—

An erratic and insufficient supply of native labour seriously restricted the scale of operations, the tonnage milled being 539,500 tons or a round average of 45,000 tons a month, as compared with 52,560 tons in the year preceding. The capacity of the plant is fully 53,000 tons a month, and could be pressed to even a higher figure; it will be clear, therefore, that a property of this character, with its extensive mining area and two reduction plants and large establishment, suffered severely in being unable to work to its full capacity. The final results, therefore, cannot be regarded as satisfactory, nor are they representative of the profit earning capacity of the mine. The recovery, viz., 28s. 4d., is 1s. 10d. lower than in the preceding year, due largely to the increasing proportion mined from the lower grade Main Reef, where more productive results could be obtained when native labour was unusually scarce. Working costs at 21s. 2·6d. were slightly lower than in the year before, this feature being satisfactory in face of the smaller scale of production. The scheme for concentrating underground transport arrangements has been gradually brought into effect; although the cost per ton handled showed no decrease, this branch of mining work has improved, as it was possible to handle larger quantities with less labour. Mining operations are still scattered over a very wide area, and owing to the unusually faulted nature of the mine an excessive number of stope faces are required for ore production. The amount of development work that could be done varied throughout the year with the labour position, and the total work, viz., 19,914 feet, was in the circumstances a large figure, especially as it includes 1,035 feet of incline shaft sinking. The payable ore developed amounted to 1,061,000 tons of an estimated average value of 6·1 dwts. A good deal of the work required to develop this tonnage was partially completed in the previous year, accounting for the large tonnage of development for the comparatively small amount of lateral footage in the present year under review. The average value of this ore development is somewhat lower than in the past, chiefly owing to the large quantity of Main Reef of low grade, which can be considered as payable under the conditions of lower working costs which had been attained during the last few months of the year. The payable ore reserve has been re-estimated and re-valued, and is as follows:—Main Reef, 811,920 tons, value 5·0 dwts. or 21s.; Main Reef Leader, 588,080 tons, value 7·1 dwts., or 29s. 10d.; South Reef, 1,073,700 tons, value 7·1 dwts., or 29s. 10d.; total and averages, 2,473,700 tons, value 6·4 dwts., or 26s. 10d. This reserve is classified as follows: 1. Ore fully blocked out for stoping, 1,992,500 tons, value 6·4 dwts., or 26s. 10d. 2. Ore valued but which will be rendered available by current stoping and ore temporarily inaccessible in old workings, 344,800 tons, value 6·0 dwts., or 25s. 2d. 3. Ore in shaft and boundary pillars, 136,400 tons, value 7·6 dwts., or 31s. 11d. Total and averages, 2,473,700 tons, value 6·4 dwts, or 26s. 10d. The above estimates are based on stoping widths averaging 72 inches, 45 inches and 57 inches in the three reefs respectively. In addition to the above ore reserve, there are developed 334,330 tons of an average value of 4 dwts., made up of blocks of ore of a value between 3·8 dwts. and 4·3 dwts., the figure taken as the present pay limit. The ore reserve as compared with the previous year shows an increase of 678,100 tons and a decrease in value of 2 dwt. The increase in tonnage is partly due to the excess of ore developed over tonnage mined and partly to the inclusion of previously developed ore, which can now be included in the ore reserve owing to the lower pay limit adopted in this year's revaluation. The decrease in the value of the reserves follows from the same reason. The underground concentration scheme referred to in last year's report has made considerable advance. The chief features are the completion of a main transport road on the 20th level between the east incline and the South Nourse shaft; the east incline having been converted into an ore pass, all ore from the extreme eastern portion of the mine is more conveniently and economically handled by mechanical means. The west incline has also been coupled up with a main road from the South Nourse shaft. The result of these arrangements is that ore from the extreme east and west boundaries can be transported to a main shaft situated midway between the two boundaries; through this shaft it is hauled to the surface and can be distributed to either of the reduction plants by a surface railway. The completion of these arrangements allows of two underground winding engines being stopped, and, in addition, No. 1 compound shaft has been shut down for haulage purposes. Increasing quantities of Main Reef and Main Reef Leader are being gradually added to the ore reserve, with a tendency to lower its average value, and in order, therefore, to obtain satisfactory profits it becomes increasingly important that the mine should be operated to its full capacity. During the past year the short labour supply has brought about a more general use of rock drills in stoping. The natural conditions in this mine are not suited in this respect, and more satisfactory results could be obtained with a more extended use of hand labour. The labour employed during the year averaged 565 white men and 3,515 natives, as compared with 643 whites and 4,662 natives in the preceding year. Attached to the report is a plan of the underground workings, which illustrates the complicated nature of the mine. The management and staff can be congratulated on the results obtained under difficult and trying circumstances met with during the year.

MODERN DIAMOND MINING MACHINERY.

[BY JAMES WEST.]

SINCE the discovery of recent diamond occurrences, and more notably that of the Premier Mine, few instances of a rapid revolution in the design of fundamental industrial machinery can be recorded. Probably one of the greatest factors in causing a rapid and much desired change may be found in the altered nature of the diamond ground itself. In the early days the whole of the occurrences consisted of a tender ground, which, on being puddled in water, produced a fine creamy slime whose consistency could be easily varied by regulating the supply of water. All machinery hitherto used for separating the diamonds depended upon an action of this kind. But of later years the occurrences have not yielded ground of this kindly nature. Indeed, the older occurrences have altered considerably, and it can now be said that with few exceptions the occurrences everywhere, both new and old, have altered their structure, and have become sharp and harsh, without the ability to puddle or slime. In conjunction with the newer occurrences therefore the treatment of the ground everywhere has presented some difficulties, and it has been found necessary to look round for more suitable machinery. "Necessity is the mother of invention," and once more the truth of this old aphorism has been exemplified. Costly experiments were undertaken by the Premier Mine Company, and resulting from these a plant capable of treating 17,500 loads per shift was designed and erected by that company. The phenomenal results obtained with this plant and the bold step made, attracted the attention of the older companies, which are now engaged in vieing with each other in producing similar plants. Plants of this design constitute a very sharp departure from the old beaten track, which invariably led only the rotary system in some form or another. The new system is, however, a revolution and nothing else. Everything is so different that the old rotary hand is completely lost in the new production. What, however, is of the most primary importance is the yield, and in this respect the new system leaves the rotary far behind, and in fact leaves little or nothing to be desired. The puddle, so dear yet so uncertain to the old rotary hand, finds no place in the new machine. The cylinder round which has waged such vexed opinion is completely eliminated, indeed there is nothing borrowed or stolen from the rotary. The new machine is not a mere improvement on the rotary but is a completely new departure, in which only the water and the ground are to be found in the old rotary. The revolution is therefore complete and far reaching. Indeed, I think it quite safe to predict that the new machinery will in a few years completely replace the whole of the existing plants. The limitations of the old machines are adequately demonstrated by the yield of the tailing heaps, and notwithstanding various improvements, the most important of which rendered the rotary almost continuous in its action, its performance is erratic and defective and far below the standard of the new machine. Whether the ground be taken direct from the mine or from the floor, or whether it be yellow or blue, the new machine will give extraction results that leave nothing to be desired. The flexibility of the new plant possesses a very wide range, yet this involves no complication or delicacy. On the contrary, it renders it highly suitable for test purposes where the highest extraction results are indispensable.

THE POSITION OF THE UNION COAL TRADE.

Effects of the Coal Combine—Prices at Capetown and Durban—General Outlook.

The following figures represent the selling prices for the last eight years of coal for bunkering contracts f.a.s., Port Natal, by one large representative colliery. The figures are taken from the annual report of the Secretary for Mines. 1907, 17s. (per long ton); 1908, 18s.; 1909, 16s.; 1910, 14s. 6d.; 1911, 14s. 6d.; 1912, 14s. 9d.; 1913, 16s. 6d.; 1914 contracts, 17s. The above were all subject to a rebate of from 3d. to 9d. per ton, according to the quantity taken for the year, and are for bunkering coal under contract entered into for the whole year in each case. The prices charged by other collieries would vary according to the colliery from the same price to about 2s. below it. A number of Natal companies co-operated from 1900 to 1909. In the three following years there was open competition between all collieries, with the result that in 1912 prices had reached their lowest limit, and the financial position of the collieries was most unsatisfactory. The result of this condition of affairs was the combination to regulate the selling price of coal. The report of the Secretary for Mines goes on to say:—The price of coal went up in 1913 all over the world, so that the increase in Natal prices during this year was probably not entirely due to the formation of the association. The price for coal in all parts of the world is being maintained in the 1914 contracts, and world conditions in the coal trade may justify even higher prices than those quoted for the present year for Natal coal. The increase of 6d. in 1914 for the best Natal coals was no doubt to some extent caused by continued losses arising from (a) irregular and insufficient truck supply, resulting in increased working costs at the mines; (b) increased cost of coloured labour, especially Indian labour, due to the stoppage of immigration; (c) increase in cost of white labour; (d) increase in cost brought about by more stringent application of and promulgation of new mining regulations, especially in regard to rations and housing in the case of coloured labour; (e) loss of coal and increase of cost due to gob fires. The prices quoted during 1910 to 1912 during the period of the worst competition resulted in most unsatisfactory financial results in the working of the coal industry. The prices had been allowed to get too low and few of the collieries were able to pay any dividends, while necessary capital expenditure for mines in plant and general betterment and for increased safety underground was rendered very difficult or impossible to the management owing to lack of funds. It was impossible for the prices of those years to continue for long without disastrous results. Questions have been raised in regard to the influence of the Union-Castle Company, who are owners of two important collieries, on the Natal Associated Collieries during the past year. The interests of the two parties, however, do not on examination appear to be identical, and the raising of prices in 1913-14 cannot be laid to the charge of the Union-Castle Company, which would be glad to have lower prices if possible. The price of Natal coal at Capetown, where a considerable amount of coal was sold for bunkering trade during 1913, was 24s. to 26s., according to the class of coal, per long ton. The prices for 1914 are understood to be 24s. 6d. to 26s. per long ton. This price has risen a couple of shillings since 1912, but it may be pointed out that freights increased enormously all over the world in 1913, as compared with 1912, and this extra charge was for increased freight pure and simple. It would appear that in future the prices for bunker coal at the various ports of the Union will maintain roughly their present figures, with possibly slight advances, as costs of freight generally throughout the world show a tendency to rise. Capetown will in future be supplied by seaborne coal from Durban, and by a certain amount of Transvaal coal from the Witbank district, which, however, will not probably be able to be carried the necessary 1,000 miles of railway, at any rate, which will enable the price at Capetown to be reduced. For the bunkering trade generally it would appear that Durban by its considerable wharfage area and the loading conveniences at that port, by its proximity to the Natal coalfields producing the best steaming coal in South Africa, and by its geographical position, will remain the centre of the bunkering trade for the majority of ships. The Capetown trade will depend largely on passenger vessels going direct to Australia and New Zealand, while the Natal bunkering trade will be more widely distributed. The port of Delagoa Bay is, however, better situated for the export trade to the East Coast, India, and the East Indies, and its position will probably enable the Transvaal coalfields to compete successfully with Durban in that class of trade in the future.

New Boksburg.

Colonel W. Dalrymple presided over the annual meeting of the New Boksburg Gold Mines, Ltd., held last week. The others present were Messrs. W. J. Gau, C. P. Marais, F. E. Scriven, A. C. Sampson, R. Smith, C. Taylor, G. W. Austin (transfer secretary), and L. S. Raymond (secretary). The Chairman, in moving the adoption of the report, said: You have before you the report of the directors for the year ended June 30, 1914, together with the audited balance sheet of the company at that date. The available cash, after allowing for the amount due to sundry creditors, was £31,909. The expenditure during the year was £4,422, and was incurred under the following headings: Claim licences, £2,451; strike insurances, £636; caretaking, £360; secretarial, London Agency and auditors' fees, rent, stationery, etc., £671; sundries, including municipal rates, repairs, ordinary insurance, etc., £304; total, £4,422; less interest and sundry revenue, £1,673; total, £2,749. As was the case in previous years, no fees have been drawn by the directors or the London committee, and the expenditure is being kept down as low as possible. The operations on the surrounding properties have not so far disclosed results which modify the views previously expressed upon the values as disclosed in the development of your claim area. Your board considers that we should continue, for the time being, to hold the property intact in the hope that the work carried on by your neighbours may give a more favourable index as to the value of your claims. During the year Mr. G. W. Higgins resigned, and Mr. W. J. Gau was appointed to fill his place on the board. You will be asked to confirm this appointment. I now beg to formally move the adoption of the directors' report and statement of account for the year ended June 30, 1914. Mr. W. J. Gau seconded, and the motion was unanimously carried. The appointment of Mr. W. J. Gau as a director of the company in place of Mr. G. W. Higgins, resigned, was confirmed. The retiring directors, Messrs. W. Pott and E. H. Read, were re-elected, as well as the retiring auditors, Messrs. C. L. Andersson & Co. and Mr. T. R. Haddon. This was all the business.

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THE DIAMOND DEPOSITS OF GERMAN SOUTH-WEST AFRICA.—III

History and Description of the Discovery—Extent of the Fields—Topographical Details.

[By Dr. Percy A. Wagner.]

THE ORIGIN OF THE DIAMONDS.

While there is a consensus of opinion among geologists that the G.S.W. African diamonds were deposited contemporaneously with the marine sediments and deposits previously referred to, diverse views prevail with regard to the source of the gems. Four main theories have up to the present been put forward. They are: (1) The diamonds were released by weathering from the crystalline rocks of the basement system; (2) the diamonds were derived from the denudation of the primary deposits of British South Africa, carried down to sea by the Orange River and distributed along the coast by the agency of the Benguela current; (3) a modification of the second hypothesis, according to which the diamonds were carried down to the sea from sources believed to exist within the interior of G.S.W. Africa; (4) the parent rock of the diamonds lies submerged off the present coast. The first of these theories, tentatively advanced before the true nature of the deposits was properly understood, may be said to have been definitely disproved by the entire absence of diamonds in the detritus, derived exclusively from the destruction of the ancient rocks, which has been carefully tested all along the littoral. The second hypothesis is effectually disposed of by the previously recorded difference between the German diamonds and those of the Union of South Africa; and by the fact that no diamondiferous deposits exist between Angras Juntas and the mouth of the Orange River, or in the lower portions of the Orange River Valley. To the view that the diamonds have been carried down to the sea from primary deposits situated in the interior of G.S.W. Africa there are several serious objections. In the first place, the diamonds, as we have already pointed out, are confined to the immediate vicinity of the coast and no alluvial deposits have as yet been discovered away from the littoral. In the second place, the various dry river beds coming from the interior have so far failed to yield a single diamond. Thirdly, river-worn diamonds appear to be entirely absent in the G.S.W. African goods. In this connection we have also the important testimony afforded by the grains of agate, by which the diamond is invariably accompanied. The constant association of the diamond with small grains of agate is one of the most striking features in connection with these remarkable deposits. It is more than likely that this association may be purely accidental, but in view of the fact that there is a fairly close relationship between the average size of the diamonds and the size of the agates, occurring on any particular section of the field, it is quite evident that these minerals have been derived from the same locality and distributed by the same agencies. The agates clearly represent the siliceous amygdales of a vesicular rock. No rock of this description is known to occur in the littoral or within the interior, but agates are being cast up along the coast at the present day, and there can therefore be no question as to their submarine origin. There only remains the fourth theory to which the fact certainly appear most satisfactory to lend themselves. It has already been pointed out that the diamonds attain a maximum average weight in the Pomona area, and this circumstance clearly indicates that the centre from which the gems were distributed is situated in closer proximity to Pomona than to any other section of the field. We are thus led to conclude that the G.S.W. African diamonds have been derived from a primary deposit, or from primary deposits, which now lie buried beneath the sea somewhere off Pomona.

On the supposition that the stones shed from the deposit or deposits were spread along the littoral by a powerful northward ocean current, similar to the one by which the coast is now swept, at a time when the littoral was still submerged, and thus found their way into the sediments there accumulating, all the previously recorded phenomena could be readily explained, with the exception of the decrease in average weight to the south of Pomona, to account for which a temporary reversal in the direction of the current would have to be postulated. With regard to the nature of the matrix of the diamonds no definite evidence is as yet available, and it is not possible therefore to offer a complete solution of the most fascinating problem that has arisen in connection with the study of the diamondiferous deposit of Southern Africa.

THE EXPLOITATION OF THE DEPOSITS.

The exploitation of the detrital deposits of G.S.W. Africa, which during 1913 yielded diamonds to the value of almost £3,000,000, is practically in the hands of six companies, namely: the Koloniale Bergbaugesellschaft, the Diamanten Pachtgesellschaft, the Pomona Diamantminen Gesellschaft, the Deutsche Diamantengesellschaft, the Kolmanskop Diamond Mines Ltd., and the Vereinigte Diamantminen, Luderitzbucht. In addition, several smaller companies are operating, but their output is quite insignificant. The individual companies will be briefly dealt with in the next chapter, and the following pages are devoted to a description of the working methods and conditions on the field.

Prospecting and Sampling. The methods adopted for determining the payability or otherwise of a likely-looking patch of gravel are very simple. In the first place a number of natives are set "picking," that is crawling over the deposit on all fours collecting such diamonds as they may happen to set eyes upon. The uppermost layer of gravel, as we have already pointed out, has invariably been enriched by natural concentration, and should the "picking" fail to yield fair numbers of diamonds, it may safely be concluded that the material is too poor to repay exploitation. In the case of very shallow layers of gravel this is the only method of sampling resorted to, but as a rule the "picking," if results have been at all favourable, is supplemented by further testing work. This generally takes the form of digging trenches about a metre in width, right across the deposit and carefully washing the excavated material. Owing to the sporadic distribution of the diamond through the gravel such test washings, except where the trenches are fairly closely spaced, are apt to prove misleading, and estimates based upon them have in many instances proved quite erroneous. The mining and dressing operations are equally simple. The usual practice is to excavate the gravel by hand, using ordinary shovels, and then to screen it by means of swinging sieves ("babies") or trommels with a view to eliminating the fine sand and of obtaining a sized product for concentration. The screened gravel was originally hand-jigged or "gravitated" in small circular sieves, or treated in hand-operated movable-sieze jigs. It was found, however, that the loss of diamonds by either of these methods amounted to from 30 to 40 per cent., and they have on this account been completely superseded by treatment in central plants equipped with mechanically operated concentrating devices. On the fields of the Koloniale Bergbaugesellschaft the gravel is excavated by means of large electric shovels, loaded into side tipping trucks, and conveyed for screening and washing to a huge concentrating plant, recently completed near Kolmanskuppe Station. The Kolmanskop Company also employs electric shovels in connection with the exploitation of the deeper deposits of gravel on its property. For the concentration of the diamond-bearing gravel various types of jigs are employed, the most popular being the Schiechel separator. The separator, a circular air-plunger jig, consists of a cylindrical tank of cast iron, about 2ft. 6in. in diameter, which is surmounted at its periphery by a closed annular air chamber, and at its centre by a convex screen of circular form with apertures of 1 millimetre. The tank is kept filled with water to a definite level, corresponding practically with the top of the screen box, by means of a suitable supply pipe. The air chamber is connected by a smaller pipe with an air-pump. When in operation the sized gravel is fed through the hopper on to the screen, over which it is uniformly distributed by means of a broad annular flange attached to the bottom of the feed hopper. Through the action of the air pump the water in tank is alternately forced up and sucked down through the gravel resting on the screen, with the result that diamonds and heavy particles settle and accumulate around the outer rim of the screen, while the lighter particles are carried over the edge of the screen box and escape through suitable discharge outlets. The tailing is passed over a dewatering screen, and the water thus recovered used over again. The concentrate which consists largely of diamonds is removed twice per diem. The jig has a daily capacity of about 4½ cubic metres of screened gravel, and the recovery of diamonds has been proved by experiments to be from 90 to 95 per cent. In the new plant of the Kolmanskop Company there are two rows of these jigs arranged in series. Schiechel jigs have been installed by the Deutsche Diamant Gesellschaft in its different plants, by the Pomona Diamantminen Gesellschaft and by the Kolmanskop and Carlstal companies. Most of the plants are equipped with 12 jigs and thus have a capacity of about 50 cubic metres of gravel per diem. As a rule the gravel is screened by dry sieving into three sizes; namely, + 1mm. −3mm., −6mm. and +6mm., each of which is separately jigged. The large central treatment plant of the Koloniale Bergbaugesellschaft is equipped with patent piston-plunger jigs, constructed by the Humboldt Company of Cologne. The jigs treat a product carefully sized by trommels and shaking screens. Wet screening has been adopted throughout. The reason for this departure being that in the past operations have on many occasions been seriously interfered with after heavy falls of dew and showers of rain, which cause the diamond bearing material to cake and thus render its trelatment by dry sieving most laborious.

Water Supply. One of the greatest problems by which the engineers on the diamond fields were originally faced was the question of obtaining an adequate supply of water for treatment and drinking purposes. It has already been pointed out that the coastal belt is to all intents and purposes a rainless desert. Such rain as does fall at rare intervals sinks rapidly into the loose sand and gravel, where it is joined by the moisture precipitated in the form of dew from heavy fogs which for days enshroud the littoral. The bulk of water thus absorbed is naturally returned to the atmosphere by evaporation, but some of it finds its way by seepage into the valleys and depressions, and by putting down shallow wells at likely spots moderate supplies were in many instances obtained. The water is brakish and unfit for human consumption, but animals soon get used to it. Most of these wells were drawn upon to such an extent that the water stored up in the superficial deposits was repidly exhausted, and the Koloniale Bergbaugesellschaft, for example, has been forced to erect a large pumping station at Elisabeth Bay, from which sea water is pumped to Kolmanskuppe through a pipe line 17 miles in length. The Kolmanskop Company also derives part of its water supply from this pipe line. Water for drinking purposes is derived from condensers erected at the coast; the water being conveyed to the workings in suitable carts, or in the case of the outlying claims in small tanks carried on camels.

(*To be continued.*)

OUTLOOK FOR THE JOHANNESBURG CONSOLIDATED.

Position Before and After the Outbreak of War—Dividend Still Postponed—"Ultimate Effects of the War" on Financial Position.

THE annual meeting of the Johannesburg Consolidated Investment is to be held on November 16th next, and the annual report for the year ended June 30th last was issued this week. The report is dated July 25, and an addendum dated September 23rd contains the following significant remarks:—

In sending out the annual report as originally framed, the directors have assumed that shareholders would like to be acquainted with the position of the company prior to the unprecedented financial upheaval brought about by the war into which Europe has been plunged. It would be futile at the moment to express any opinion as to the ultimate effects of the war upon the general financial position of the world, and time alone can solve this question. In so far as the company is concerned, the directors desire to say that they are taking all possible steps to safeguard its interests. It is most satisfactory to record that there is every prospect that the gold mines will continue working as usual, and that for obvious reasons, every assistance will be afforded by the Government to maintain and if possible increase the gold output. In accordance with the report a dividend of 5 per cent. would, under ordinary circumstances, have been paid to shareholders on the 24th September. In view, however, of the existing financial crisis which renders unavailable the bulk of the company's usually liquid resources, the directors have decided that the payment of the dividend must be postponed, and they trust that shareholders will readily recognise that, under the circumstances, no other course was possible.

THE REPORT.

The report itself has the following, *inter alia*: -

It will be seen from the accounts that the year's operations have resulted in a net profit of £199,595 15s. 7d., which, together with £168,429 12s. 11d., brought forward from the previous year, makes an aggregate available balance of £368,025 8s. 6d. On the 20th June a dividend of 5 per cent. was declared by the Directors for the company's financial year ending 30th June last, which is payable to shareholders registered at that date. Warrants will be posted on the 24th September. This distribution absorbs £197,500, leaving £170,525 8s. 6d. to be carried forward to next account. The directors regret it is necessary to record that during the whole of the company's financial year there has been an almost unbroken continuance of acute market depression, which has prevented the company from materially augmenting its ordinary sources of revenue. The conditions referred to have been largely responsible for the market quotation of certain of the company's shareholdings falling considerably below what the directors consider to be their intrinsic value. This depreciation has, as usual, been fully provided for by writing down all such shareholdings to their respective market quotation at the 30th June last. It is, however, very satisfactory to be able to state that the aggregate market value of the company's shareholdings is very largely in excess of the amount at which they appear in the balance sheet. The company continues to hold a large proportion of liquid assets, and the financial strength of its position is fully maintained. The various reports published from time to time have dealt fully with the mines' operations in which this company is interested. Special mention, however, may be made of the Consolidated Langlaagte, Van Ryn Deep, and the Witwatersrand Gold Mining Company (Knights). The returns from the first named property have exceeded expectations, and the prosperous future of this company seems thoroughly assured. Dividends amounting to 20 per cent. have been paid during the last twelve months, and the directors anticipate that, whilst maintaining this basis of distribution, the company will be in a position to redeem its debentures long before the expiry of the time prescribed for their redemption. The Van Ryn Deep is proving a most valuable mine, and for confirmation of this statement it is only necessary to refer shareholders to the company's progressive monthly profits. Within twelve months of the commencement of crushing operations dividends of 7½ per cent. and 12½ per cent. respectively have been paid. The Witwatersrand Gold Mining Company (Knights) is more than maintaining its high standard of profits, and has increased its dividend to 50 per cent. per annum. The development results on the Government Gold Mining Areas (Modderfontein) continue very satisfactory, and as foreshadowed in the report of 1913, it is expected that crushing operations will commence about November next. With regard to the principal diamond mines of South Africa, the directors look forward with confidence to an early removal of the adverse factors which have recently affected the products of the industry. The aggregate value of the gold produced by the mines under this company's control amounted to £3,018,447, indicating a substantial increase of £522,240 as compared with the previous year, and £904,447 as compared with two years ago. It is also noteworthy that this company's group of mines distributed £977,192 in dividends during the year under review, the total being £393,655 in excess of the previous year. Owing probably to the unsettling influence caused by the recent strikes, applications for building sites show a diminution as compared with last year, but the revenue derived from the company's town properties, including the Carlton Hotel, is under the circumstances satisfactory.

Remission of Claim Licences.

The question of the remission of claim licences, which had been raised by the action of the Pilgrims Rest Mines and Claimholders' Association, came before the House of Assembly recently in the discussion on the "Public Welfare and Moratorium Bill." From the reply given by the Minister of Mines and Industries we do not think he fully comprehends the position of affairs here as regards the small owners and prospectors and diggers. Mr. Emile Nathan appealed to the Minister of Mines to make provision for the remission of claim licences during the continuance of the war, and in this he was supported by Sir Percy Fitzpatrick, who urged that the provision under which claim licence holders lose their title if they fail to pay licences for a certain period should be waived. The Minister of Mines, though sympathetically inclined, pointed out that the Government derived an amount of £370,000 from these licences, and could not single out one special class of taxpayers for remission. However, where deserving cases came to the notice of the Government he promised he would ask Parliament's consent next year to reinstate such people who had lost their title; meanwhile the lapsing of the claims of such persons would not be advertised. Neither Sir Percy Fitzpatrick nor Mr. Nathan were satisfied with this; neither are we. We do not think that the Minister of Mines and Industries understands the position of affairs here at all, says the *Sabie News*. For, speaking on the same subject, he is reported to have said: "It would be a mistake at present to suspend payment of claim licences in the Transvaal. Most holders of these licences had taken out bezitrecht, under which they had nine months' grace." Now we have made enquiries into this matter, and we have official information that very few claims indeed in this district are held under bezitrecht, and those wihch are so held are by big companies, such as the Transvaal Gold Mining Estates or the Glynn's Lydenburg. It can be safely said that no small owner or prospector or digger has a bezitrecht title here. It is on the Rand where most of the claims are so held, and it is with regard to claims held on the Rand to which the Ministers' remarks applied. Now what is the good of the Minister going to Parliament next year to ask consent to reinstate such persons who have lost their title? It would be months before the class referred to would learn their fate; and in the meantime that for which they had expended all their savings for years would have slipped from their hands. In many cases they would not even have the means to bring their cases to the notice of the Minister. Who, too, is to distinguish between a deserving and an undeserving case? Is the matter of "deserving" to be determined by what the holder has lost in licences paid to the Government, or is it to be settled by the amount of work the applicant for consideration has done on his claims? In either case the task of the official asked to differentiate would be an invidious one. The Government, by the way, is not asked to remit payment of the licence moneys on all claims, but only on those which are unproductive; and, surely, where there is no prospect of earning there should be no taxes. The Claimholders' Association should not allow the matter to rest where it does now it should renew its labours, and strive to make the Minister understand that the "conditions which obtain in our "poor man's field" are totally different to those which obtain on the Rand; and that being different, he ought to devise some legal machinery by which he can differentiate and afford relief to men who, at the present time, are hard put to it to make both ends meet, and see ruin staring them in the face in the near future.

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TRANSVAAL CHAMBER OF MINES QUARTERLY REPORT.

Many Questions Considered—War Arrangements.

The report of the Executive Committee of the Transvaal Chamber of Mines, to be presented to the meeting on Monday next, states, *inter alia*:—

Natives Employed in Labour Districts of Transvaal. The monthly report issued by the Department of Native Affairs shows that at the 31st July, 1914, 257,236 coloured persons were employed in labour districts of the Transvaal. Of this number, 204,613 were engaged on mines and on the various classes of works, i.e., chemical, metallurgical, brickmaking and other works as defined in Part I. of the Coloured Labourers' Health Regulations, 1906, and 52,623 were in other employ.

Native Grievances Commission. On the publication of the report of the Native Grievances Commissioner (Mr. Buckle), the Executive Committee, assisted by the Association of Mine Managers and the Committee of Consulting Engineers, carefully investiged the various recommendations. In regard to some of them it was found necessary to ask the opinion of a Medical Committee, which is now engaged in considering them. The detailed comments of the Chamber on the remainder of the recommendations have been sent to the Director of Native Labour. The Executive Committee agrees with the majority of the recommendations.

Income Tax Act. In view of the difficulties that are likely to arise in the interpretation of the Income Tax Act, 1914, the Executive Committee has appointed a Sub-Committee, consisting mainly of secretaries and auditors, to deal with the routine of the Act in the same way as the details of the working of the Mining Taxation Act are dealt with. In one respect in particular, namely, the lines to be followed by companies in deducting income tax as agents for debenture holders resident abroad, the Act is extremely vague, and companies seem to be required to account for tax, the amount of which they cannot determine.

Miners' Phthisis Act Amendment Act.—Following upon the report of the Select Committee on the working of the Miners' Phthis Act, an Act amending that Act in certain respects was passed. The more important of the amendments are (1) the increase in compensation to men classified as partially incapacitated from £96 to £200; (2) the requirement of a medical certificate in respect of all natives desiring to work underground; and (3) the six-monthly medical examination of all natives employed. The procedure to be followed in the grant of medical certificates to natives applying for work was agreed upon between the Department of Native Affaire and your Committee, and came into force on 1st August, 1914, the date on which the Act came into operation.

Miners' Phthisis Act—Definition of "Miner."—Under the definition of "miner" in the Miners' Phthisis Act, 1912, some doubt arose as to whether men employed partly underground and partly on the surface were included under the Act, and the Chamber arranged for a test case to be instituted to decide the point. Owing to a provision in the Miners' Phthisis Act Amendment Act for the submission of any such doubtful cases to the final decision of the Government Mining Engineer, the necessity of the test case no longer exists, and it has accordingly been dropped.

Workmen's Compensation Act. Under the new Workmen's Compensation Act passed in June compensation is payable to native labourers who are injured by accident on the same scale as they are now compensated for miners' phthisis. The Act in other respects closely follows the lines of the Transvaal Workmen's Compensation Act.

Precious and Base Metals Act Diggers' Licences. The test case referred to in the report of the Executive Committee, dated the 15th June, 1914, to decide the rate of licence to be paid for certain digger's licences has been decided in favour of the Government.

Mining Supplies. In order to meet the dislocation of trade which seemed probable at the time of the outbreak of war, the mining industry took steps to ensure as far as possible an adequate and continuous supply of mining stores. Generally, supplies will continue to be obtained by the mines in the ordinary way through local merchants, and only in the case of cyanide, mercury and zinc has it been found necessary to enter into large contracts in London. With regard to these three articles, and also in regard to the articles which continue to be ordered locally, the position is satisfactory, and, so far as can be seen at present, the main supplies to carry on the work of the industry will be available at prices not greatly higher than in times of peace.

Disposal of Gold Produced. In addition to providing for adequate mining supplies, it was necessary to arrange for the disposal of the gold produced by the mines, which in normal circumstances is shipped to London weekly. As members are doubtless aware, an arrangement has been arrived at between the Goverment, the Bank of England, the mining industry and the South African banks, under which the Bank of England purchases the gold produced by the mines when deposited in the local banks in the name of the Minister of Finance to the order of the Bank of England. So far as the mining industry is concerned, this arrangement provides practically the same facilities as existed when the gold was shipped weekly to London, although at somewhat higher charges.

Dividends. Owing to the existence of a moratorium in Great Britain, mining companies were in many cases unable to withdraw from the banks moneys set aside for the purpose of paying the dividends declared in June of this year, and consequently a postponement of the payment of these dividends was necessary. Arrangements were ultimately made with the banks for the release of the necessary funds, and the payment of the dividends has now taken place.

Insurance of Gold. Prior to the outbreak of war, an endeavour was being made by your Executive Committee to place the system of insurance of gold upon a better footing, by separating the insurance into two portions; first, the insurance of the gold while on the mines awaiting shipment, and second, its insurance while actually on the way from the mines to London. Owing to the outbreak of war, this matter is at present in abeyance.

Underground Learners and Apprentices.—Arrangements are about to be made under which all mines on the Witwatersrand will employ a definite number of underground learners and apprentices in proportion to the number of men employed on various classes of underground work. Thus each mine will be required to train every six months at least one learner for every fifteen timbermen or hammermen, and one for every ten machinemen.

Payment to Employees on Active Service. At the commencement of the war, the members of the Chamber agreed that the posts of mine employees on active service as British reservists and members of the Defence Force will be kept open for them, while in the case of men with dependants half wages will be paid until further notice. Similar conditions have also been granted to men who have volunteered for active service with the consent of their employers.

Medical Officers' Sub-Committee. The Executive Committee has appointed a Medical Officers' Sub-Committee, consisting of a medical officer nominated by each group, to advise the Executive Committee on medical matters connected with the mines.

Panama-Pacific Exposition.—The Executive Committee has provided for the representation of the Chamber at the Panama-Pacific Exposition to be held in San Francisco in February, 1915. It is intended to exhibit an obelisk and two spheres representing the Transvaal gold output as compared with that of the rest of the world, and also a model of a modern surface plant on the Rand. A number of stereoscopic views of work on the gold mines, and certain typical specimens of banket, will also be exhibited.

Transvaal Chamber of Mines Benefit Society.—In August a Benefit Society for the employees of the Chamber, the Native Recruiting Corporation, Ltd., the Rand Mutual Assurance Co., Ltd., the Witwatersrand Co-operative Smelting Works, Ltd., and the Witwatersrand Native Labour Association, Ltd., was established, the various bodies concerned contributing to the funds of the Society on the £ for £ principle. The head office staffs of mining companies in Johannesburg may be admitted to membership of the Society under certain conditions.

Representation. The following changes in representation have taken place:—General Mining and Finance Corporation, Ltd.: Mr. H. W. Dalton, *vice* Mr. G. Nathan. Springs Mines, Ltd.: Mr. M. G. Elkan, *vice* Mr. F. Elkan. Main Reef West, Ltd.: Mr. W. H. B. Frank, *vice* Mr. E. Wolfes.

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Finance, Commerce, and Industries.

Germany's Trade in Brass Wares.

One of the industries in which Great Britain has fallen very much behind her German rivals is in the manufacture of brass and brassware for export. The latest monograph issued by the Board of Trade deals with this question. Some of the causes which may have led to loss of trade by British merchants are referred to in the report of the Special Commissioner sent to South Africa in 1903 by the Board of Trade. With regard to the business in fire-grates, fenders, etc., he said:—So far this trade is almost entirely British, and there is no reason why it should not remain so, if manufacturers will take the trouble to pack their goods with greater care. The very worst packing I saw in South Africa was in the hardware trade. In a single case of fenders, for instance, eight arrived at their destination broken, because they had been packed in so large a case that there was six inches clear space left at one end between the fenders and the case. On account of similar careless packing, out of a single consignment of 72 fire grates, 71 arrived more or less damaged. At every hardware establishment I visited complaints were made of British packing. Apart from the question of packing, this branch of trade is well catered for by British manufacturers, and remains almost exclusively in their hands. In brass and manufactures of brass, British goods predominate, but there is some competition from Germany and Belgium in the cheaper class of fittings. The Germans practically monopolise the trade in fine brass wire, the reason given by merchants being the cheapness, superior finish, better packing and greater regularity of the German product.

* * * *

The Moratorium.

In the more important section of the new Act dealing with the moratorium which is now in force, it is laid down that if during the existence of the present war a defendant in any suit, action, or proceeding in any court of law to enforce claims or liabilities contracted before August 4, 1914, prove to the satisfaction of the Court that he is solvent, but as a result of the war he is unable to fulfil his liability, then the Court may (a) extend the term for fulfilling such obligation, or (b) allow the trial to proceed and, if judgment be against the defendant, issue an order staying the execution of the judgment for such time and under such conditions as seem just and equitable, provided no postponement be granted beyond three months after the cessation of the war. Further, during the war any person with liabilities contracted prior to August 4 may apply to a creditor for an extension of time, and in the event of refusal, the debtor may apply to the Supreme Court or Magistrate's Court, which is authorised to grant an extension should it see fit under conditions similar to those just mentioned. To arrive at its judgment the Court may call in two assessors to be appointed by the Governor-General. All Civil remedies whatsoever against any member of the Defence Force or His Majesty's Forces on active service are suspended whilst that member is on active service and for three months thereafter. Any person so debarred from obtaining payment of money due to him shall be entitled to claim six per cent. interest during the period of extension or until payment of the principal sum, if payment be made before the termination of the extension. Magistrates' Courts are given special jurisdiction to deal with such matters.

* * * *

Union Finances.

The Finance Department has now published its full statement of revenue and expenditure for the month of August, and the position may be regarded as very fairly satisfactory under the circumstances. Total revenue for the month of August came to £1,195,610, and total expenditure to £1,125,505, leaving a balance to the good for the month of £70,105, and showing that we are, at all events, not piling up a deficit so far during the war. Compared with the revenue collected in July, £1,259,074, August only shows a decrease of £63,464, which cannot be regarded as particularly important. Expenditure for July was £1,250,063, so that economies practised during August came to £114,558, which is also satisfactory, and betokens a most judicious treatment of the crisis. The full revenue connected from the 1st April to the 31st August was £5,924,346, as against £6,763,394 for the same period of 1913-14, or a shortage of £839,048, a fact which is unpleasant; especially when one notes that expenditure for the five months of 1914-15 was £7,048,321, against £6,423,264 for the same period of last year.

* * * *

War and Insurance.

The sixty-ninth annual meeting of the South African Mutual Life Assurance Society was held this week, when the Chairman, Mr. Steytler, in the course of a review of the year, remarked that that Society had been called upon to contribute very heavily out of its savings for income tax. Continuing, he said the European war would of necessity have its serious effect upon the affairs of this country, and development would doubtless be retarded for a time, but in the light of the Society's experience of the South African war—and they did not anticipate that events were likely to bear more heavily upon them than during that period—they could look to the future with unabated confidence. Any possible loss from war claims could only be fractional as compared with the South African war, when they had policy holders fighting on both sides, and as they were all aware payment of claims during that period did not seriously affect that Society, the return to members in the shape of revisionary bonuses continuing throughout on the usual scale. However much they regretted the outbreak of this unfortunate war, there was no need or room for pessimism in regard to the future of South Africa as a whole or of that Society in particular.

Chamber of Commerce and German Trade.

The report of the Executive Committee of the Chamber of Commerce submitted to the monthly general meeting of members yesterday, included the following interesting items:—As a result of meetings of the wholesale and retail sections of the grocery trade a joint committee was appointed to revise the schedule of maximum retail prices. The prices then agreed to were published in the Press on August 28, and it has not been deemed necessary to make any further alterations. Copies have been published in the Press of a circular letter issued by the Trade Commissioner representing H.M. Board of Trade with regard to the efforts being made by British manufacturers to capture trade which has hitherto gone to Germany and Austria. Inquiry is made as to the extent to which the members of each Chamber of Commerce are prepared to assist in the promotion of British trade along the following lines, viz.:—(1) By the purchase of British-made goods in preference to those of foreign manufacture, even at some sacrifice, for which, however, the future will compensate; (2) by strenuous endeavours to create a taste for British-made goods among customers who, in the past, have had a preference for foreign manufactures; (3) by the use, to the greatest possible extent, of the machinery of the Board of Trade for the purpose of promoting British trade interests in the South African market. The committee trusts that members will carry out these recommendations so far as they find themselves able to do so. In reply to the committee's inquiry, the Provincial Secretary notifies that the Administrator in Executive Committee has decided, in view of the urgent need that exists for effecting economies in every possible direction, to suspend till further notice all contracts which have not been signed by the successful tenderers and their sureties. The contracts which are at present in hand will be completed.

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Base Metal Prices.

The Committee of the London Metal Exchange posted the following notice recently: "In order to facilitate the squaring up of contracts private dealings in the Room between individuals are permitted, but not below the present settlement prices for copper of £56 10s. per ton, tin £133 per ton, and Cleveland iron 51s. per ton. Lead and speltzer (zinc) dealings are unrestricted as to price. 'Rings' are still barred, and there will be no official quotations, nor may prices be reported. Members may, of course, continue to deal without restriction privately outside the Room and its precincts." The prices mentioned above are the same as those ruling when the Metal Exchange was closed at the end of July.

* * * *

Swaziland Ranching.

The first annual general meeting of shareholders of the Swaziland Ranching and Development Company was held at Maritzburg this week. Mr. E. W. Evans, Chairman of the company, presided, and, *inter alia*, said:—Our little company is among the first to begin real ranching operations; observation has shown us that we have the very best country. We have, I believe, as good foundation stock as any other concern, and have chosen the right breeds for grading; we have overcome the first and worst initial difficulty in acclimatising cattle, and I consider our future as promising as our financial position and stock of cattle will allow. In saying this I would point out that we have, with the agreement of shareholders, purchased twice as much land as was originally intended, and have almost as many cattle thereon as we in our original estimate hoped to obtain. But it is abundantly evident that to secure early and substantial returns, the land should be more fully stocked, and I would like to see 5,000 head put on the Natalia Ranch during the next year or two. We have the shareholders' authority to issue more shares for this purpose, and would probably have succeeded to some extent, but for the unfortunate outbreak of this terrible European war.

MINING MEN AND MATTERS.

Sir Abe Bailey has returned to the Rand.

* * * *

Sir George Farrar has joined the Union Defence Force Staff.

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Amongst the arrivals by the mail boat this week are Messrs. A. C. Holtby and W. F. T. Harvey.

* * * *

Mr. U. P. Swinburne, Chief Inspector of Mines, and of the reserve of officers, has, with the permission of the Union Government, been called up for service in Europe.

* * * *

Herr M. von Rapp, the senior London manager of the London agency of the Deutsche Bank, who served on the London Committee of the National Bank of South Africa, has resigned from the latter position.

* * * *

Mr. F. R. Booth has been appointed Sales Manager for the Pretoria Portland Cement Co., Ltd., with offices situated in Cullinan Buildings. Mr. Booth has been associated with the company for the last eight years, and is very well known in local business circles.

Luipaardsvlei Estate.

During August the Luipaardsvlei Estate crushed 19,006 tons, yielding a total profit of £3,007.

Nigel G.M. Co.

The returns from the Nigel mine for August are as follow: Gold, 3,972 fine ozs.; profit, £1,370; stamps working, 55; tons milled, 11,000.

Blaauwbosch Diamonds.

The washing returns from the Blaauwbosch mine for August are as follow: Blue ground washed, 1,436 loads; recovered, 768½ carats, or 17·32 carats per 100 loads. Washing was discontinued on the 17th August in consequence of a breakdown of the gas engine plant, which cannot be repaired in this country.

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Engineering Notes and News.

ADVANCES IN CHEMICAL ENGINEERING.

A LONG and interesting paper on "Some Recent Advances in Chemical Engineering" was read before the Northern Engineering Institute of New South Wales on the 27th June by Mr. T. Grantham Giddy, F.C.S., and discussed at the July meeting of the above body. In the course of the paper Mr. Giddy said that no large manufacturing concern exists in the German Empire that has not connected with it a more or less complete laboratory and an efficient staff of trained chemists, many of whom devote the whole of their energies to research work. The research chemist was not expected to show immediate results, but every facility was provided for him, so that haply he might, after months of investigation, or it might be years, reward his employer by producing something of commercial value. To such enterprise they owed the discovery of synthetic rubber, Jena glass, Welsbach mantles, aniline dyes, etc. Unfortunately, the inherent conservatism of the English speaking races, their devotion to time-honoured practices, and their natural disinclination to adopt what to many appeared to be revolutionary methods had militated against widespread chemical investigation on commercial lines in British Dominions. Certainly there were signs of awakening in the United Kingdom, and some firms stood out conspicuously in this respect; and it was time, if Britain was to maintain her supremacy in manufactures, that she was not only awakening, but fully awake. In spite of the enterprise and aggressiveness of Americans in many walks of life, a charge of the same kind could be laid at their doors. Recently a chemist visited one of the largest glass-making works in America, and, seeing a certain substance used in great quantity, he asked the manager for what purpose it was employed. The latter replied that it was used to oxidise into the ferric state the iron in one of the ingredients. "But," said the chemist, "the iron is already in the ferric condition, and the use of this expensive oxidising material is unnecessary." Acting on the advice given, the manager omitted the substance in question, with satisfactory results so far as the glass was concerned, and, at the same time, with a saving of £50 per week to the company in this article alone. Other examples of a like nature were given by the author of the paper, which went to show, he said, the folly of neglecting chemical investigation. Mr. Giddy went on to refer to the latest uses of calcium carbide and aluminium carbide, to the alumino-ferric process in the reduction of metals, and to the possibilities of liquid air. A considerable portion of the paper was devoted to the explanation of certain processes for the softening of water, a matter of first importance to those who are running boiler plants, etc., in districts where the water is "hard." In conclusion, the author of the paper pointed out that ozone is being extensively used for the sterilising of water, and that alumino-ferric was now regarded in certain quarters as peculiarly suitable for sewage treatment. In the discussion on the paper many other points were brought out, and some of the engineers present said they would like to hear more about the water softening processes, including that known as the "Luminator," in which the water is run over a sheet of aluminium, for the hardness of water was an almost general source of trouble to men who have to use steam power.

Ventilating Pipes in Mines.

A useful novelty in ventilating equipment, especially adapted to the wide connecting drives, raises, and winzes of this district, has been recently applied at the State Mines, the inventor of the idea being the manager, Mr. Graham Bell, says Col. G. Bottomly, Inspector of Mines, Boksburg district, in his last annual report. The device consists of one-eighth steel plates, 6 feet by 4 feet, bent to U shapes 18 inches deep by 18 inches across. The sections are inverted and laid on the floor of the drive, loose ground being placed against the contact with the rock to ensure a tight joint. Sections are machine-rolled, and are capable of being bolted together in a tight joint, assisted by tarred cloth. The available area in these pipes is two square feet, which is far superior to the 10-inch galvanized iron pipes in common use, and their comparative immunity from damage places them, in my opinion, above anything else in use at the present time. The manager has tried galvanized iron pipes at 10d. per foot and corrugated iron bratticing along the main connection drives at a cost of 5s. per foot, but has given both up in favour of the steel pipes now in use, which cost 3s. 7d. per running foot, and require practically no maintenance.

Machine Drilling Improvements.

Under existing conditions it is found that the actual drilling time for machines on the Rand is less than five hours per day, and as men are paid for an eight hours' day it is apparent that the time wasted in cleaning down and rigging up the machines constitutes a serious loss to the industry. To meet this wastage and at the same time to obtain more holes per machine shift the Modderfontein "B" has, recently, inaugurated a totally new departure, under which expert stope timbermen with blasting certificates are instructed to go underground some hours before the drilling shift, and after making the stopes safe and cleaning down the faces, to rig up the machines ready for an immediate start when the shift comes down. In some cases the stope will be attended to in a similar manner by the regular night shift lashing gang where only day drilling shifts are engaged. "With the high wages paid to machine men," says Col. Bottomley, in his last annual report, "I see no reason why even the blasting should not be done by a special gang, thus leaving the drillers to devote a full eight hours to their work. The reduction in working costs under these conditions would be very considerable, and would probably in the end lead to the abolition of contract stoping."

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New Water Drills on the Rand.

"Towards the latter end of the year 1913," says Col. Bottomley, Inspector of Mines for the Boksburg district, in his last annual report, "two light hammer water rock-drilling machines, viz., the Leyner and the Atlas drills, were introduced into some of the mines. From figures kindly given by the managers using the drills the results are extremely satisfactory. The drills have many advantages over the piston drills in that they weigh only about one-third, require fewer persons to run them and above all it is impossible to work without water, which is fed to the face of the bit through hollow steel. All the drills are star bit and the holes consequently start at a smaller diameter and finish up only slightly less. The cost of the drill is almost double that of the large piston drill and up to now it is impossible to say what up-keep will be. It is difficult to compare one mine with another, but it will be of interest to take individual cases of the work done. In one case of stoping, two Leyner drills with one white man and four natives drilled twenty holes 6 feet 4 inches deep, while to do the same work with the piston drill it took one white man and eight natives with four machines. In driving, two Leyner machines with one white man and four natives drilled fourteen holes 6 feet deep in five and a half hours, while to do the same work with the piston drill it took one white man and seven natives seven and a half hours with three machines. The Atlas drilling figures are better than these of the Leyner, but in this district this type has not been experimented with to the same extent. The Atlas steel is smaller than the Leyner, and permits of more holes being drilled per shift, but on the other hand, the burden on the holes is less than that in the case of the Leyner, and consequently less ground will be broken. From the figures available it is evident, providing maintenance charges are not abnormally high, that these two drills—especially the Leyner—give promise of eventually revolutionizing machine-drilling costs. In addition to this important aspect of the new drills, the total absence of dust in drilling operations is a feature which deserves the greatest encouragement as tending to eliminate miners' phthisis."

Winding Plants in the Union.

The inspections of winding plants in the Transvaal in 1913 numbered 160, and 89 tests of brakes were carried out during the year, says the annual report of the Mines Department. There were nine unsatisfactory tests or inspections, but in all cases the defect or deficiency was attended to and the permits subsequently granted. These inspections, in most instances, do not have reference to new winding plants, but were carried out in cases where alterations to the machinery or in the carrying capacity had taken place. Fifty-six permits were withdrawn during the year owing to work being stopped in certain shafts, or to the fact that new winding plant was installed, in which latter case new permits were issued. The total number of permits in operation as at 31st December, 1913, was 378, these applying to 672 compartments in 241 shafts at 79 mines. The number of winding ropes in use on the licensed plants was 668. The conveyances (cage, skip, trolley, or bucket) at these shafts were licensed up to a total carrying capacity of 9191 persons. The number of electric hoists licensed for transport of persons continues to increase. At the end of the year there were in operation 75 induction motor hoists with an aggregate horse-power of 40,144, and 16 Ward-Leonard hoists with an aggregate horse-power of 15,755. At Kimberley (Cape) the total number of winding plants hauling men in operation at 31st December, 1913, was 20, working in 37 compartments, in 20 shafts at 5 mines. The number of ropes in use on these hoists was 37, and the number of persons that could be raised or lowered or raised at one time was 229. It has only been possible, however, to issue complete permits in three cases. In the other plants the question of the fitting of safety-catches is still under consideration. In the Orange Free State thirteen winding plants were inspected and tested. Four inspections and one test were unsatisfactory, but were subsequently repeated and the plant found to be in proper working order. The total number of permits in force as at 31st December, 1913, was 8, applying to 8 shafts at 5 mines. The number of winding ropes in use on the licensed hoists was 10. The conveyances at these shafts are

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licensed up to a total carrying capacity of 124 persons. In Natal nine winding plants were inspected and tested during the year. The total number of permits in operation at the end of the year was 12, these applying to 24 compartments in 12 shafts at 10 mines. The conveyances (cages) were licensed up to a total carrying capacity of 177 persons.

"Safety First."

The United States Bureau of Mines has published an interesting bulletin, the purpose of which is to draw attention to the need of signboards in the underground workings of mines, and to suggest a set of universal symbols for adoption throughout the mining districts of the United States. Many mine officials who have spent years at a single mine do not see readily the necessity for mine signboards; because they are entirely familiar with the mine workings it does not occur to them that the average miner cannot in a short time acquire the same familiarity with conditions. In the United States to-day both the metalliferous and coal miners are largely of a roving disposition. Many of them are foreigners who are more or less ignorant of English. Mine signboards are in use in many mining districts of the United States. Although in no part of the country has the practice become general, there are isolated mines that have worked out elaborate systems of signboards.

Symbol of Danger. Red is the colour in general use to indicate danger, and there appears to be no good reason why this colour should not be used in mining. It is recommended that a circle filled in solidly with red, making a red ball, and painted on a white background be adopted as the universal symbol of danger. This symbol is already in use as a danger sign in mines. Used without words, it may be employed either on surface or underground to give warning of danger of places or [illegible]. It is often desirable to call attention to the character or condition of the danger present. In such cases words may be used or a hand or other device may point toward the danger, whether it be overhead, underfoot, or straight ahead. For reasons that will appear in the following paragraph, an arrow should not be used for pointing toward the danger.

Symbol of Safety. It is recommended that the universal symbol for indicating the direction to safety be an arrow, painted, or, in case of emergency, chalked on either a light or dark background, and without wording, the idea being to make the arrow the symbol of safety.

General Use of Mine Signboards. In addition to the universal symbols suggested herein there are many other useful signboards that should be used in and about the mines. However, owing to the difference in conditions prevailing in the various classes of mines, there is no one set of signboards that would be applicable to all mines. The selection will depend on the type of the mine and, to a certain degree, on the class of miners employed. As an aid in the selection of an adequate system the following list of signboards that have been noted as in use in various parts of the country is submitted:—

Signboards for Points on the Surface.

"Danger: Keep Away."
"Do Not Walk on these Tracks."
"Danger: Keep Away from Shaft Collar."
"No Smoking Allowed Around Shaft Collar."
"Look Up." (Under trestle where rock, ore, or coal is handled.)
"Keep Out."
"No Admittance Without Permission from Office."
"Live Wire."
"High Voltage. Do Not Touch."
"**Safety First.**"
"Riding on Incline Forbidden."

Signboards for Pump Stations.

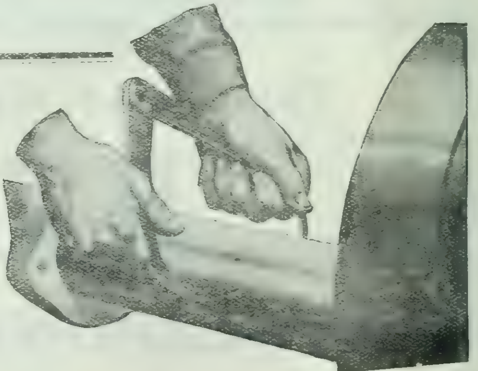
"Keep Only Waste in Receptacle Provided."
"Do Not Oil the Timber—Oil the Machinery."
"Do Not Hang Candles or Lamps on Timber."
"Keep this Place Clear of All Rubbish."

Signboards for Mine Workings.

"To 2nd Outlet Shaft" (with arrow or hand pointing).
"Ladderway to 12th Level."
"To Main Shaft" (with arrow pointing).
"To Timber Shaft" (with arrow pointing).
"Dangerous Ground—Keep Away."
"Danger Overhead."
"Look Out for Motors."
"Danger—Dynamite Stored Here."
"Danger Ahead—Old Workings."
"Ladderway to Surface."
"Danger from Ore Trains—No Travelling in this Tunnel" (or drift)

Rezende Mines.

The results for the month of August, 1911, are as follows:—Estimated profit: Central Section, £2,137; Old West Workings and Penhalonga Sections, £949; total, £3,086.



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caused by packings that do not contain lubricant but are friction producing ?

"PALMETTO" PACKING

is so constructed as to permit the rod to slide along it without resistance.

The bearing surface against the rod is kept in a constant state of lubrication from the packing itself, and

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NO MATTER HOW YOU CONSIDER "PALMETTO" IT'S THE PACKING OF ECONOMY.

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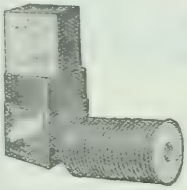

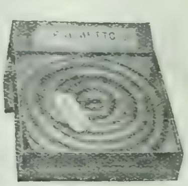

The Week's Company Meetings.

T.G.M.E.

Record Profits.

Improved Prospects.

The annual meeting of shareholders in the Transvaal Gold Mining Estates was held last week in the board-room, Corner House. There were present Messrs. H. C. Boyd, chairman, A. G. Gill, L. G. Heard, M. Honnet, F. H. Barry, C. H. Dawe, S. M. Nelson and W. S. Lewis, secretary.

The Chairman said: Gentlemen,—The reports and accounts for the twelve months ended the 31st of March last are now submitted for your approval. The year's profit of £285,468 18s 3d. was the largest yet made by the company, despite the fact that during the greater part of the period extreme shortage of native labour was experienced at the Central Works, resulting in the crushing of a decreased tonnage there and a consequent slight rise in the cost per ton milled. Taken all round, however, the expenditure per ton showed a slight decrease, as there were material reductions at Elandsdrift and Vaalhoek, where the labour supply was ample. Dividends were declared at the same rate as during the previous twelve months, namely, 37½ per cent., absorbing £226,584. Provision was made for the profits tax due, amounting to £26,340, and debentures to the nominal value of £11,144 were purchased at satisfactory prices, making the total purchases of debentures at the close of the year £32,580. Owing to the amount recovered under the fire insurance policy after the destruction of Brown's Hill Power Station, the expenditure on capital account, which is detailed in the directors' report, was more than met, a credit of £700 being shown. The unappropriated balance carried forward was increased to £101,938 15s. 6d., and the substantial credit of £11,624 remained available against future development expenditure.

Labour Supply.

In view of the position of the labour supply at the Central Mines, it was necessary to exercise considerable judgment in the use of the available force in order that as much development as possible should be done consistent with not unduly penalising the monthly profits. The satisfactory profits recorded, and the fact that the ore reserves showed a general slight improvement indicate, as I think you will agree, that a reasonable policy was pursued, but undoubtedly the scale of development operations was less than was desirable. The importance of pushing development work to the utmost is fully recognised by the management, and the labour supply being now greatly improved, prospecting and development in the central area has been increased to a very large extent. The general manager's report and the reports of the managers of the different mines provide a very full record of the past year's work and have been so long in your hands that they need not be referred to in detail. Generally speaking, development results were satisfactory, except on the dip of the Peach Tree Mine, where they continued to be consistently disappointing. Due emphasis has been given to this fact in quarterly reports, etc., and may possibly have been indirectly responsible for the adverse rumours which were current some months ago regarding the position and prospects of the company. An official statement was issued in February contradicting a definite misstatement which was in circulation in connection with Duke's Hill development, and giving details of the satisfactory ore reserve position, but some of the rumours were of so vague a nature that it was impossible to deal with them.

Ore Reserves.

At date at the Central Mines the position of the ore reserves remains practically unchanged. In the Duke's Hill South Mine, though it had to be stated in the report for the quarter ended the 30th of June last that development had not been as good as usual, the general manager is able to report, reviewing the whole period since the close of the financial year, that the mine has continued to develop well, the extension of the channel towards the dip being maintained. Connection will be effected in about two and a half months between this mine and the Peach Tree Mine at a point about 1,300 feet towards the dip from the first connection between the mines. The completion of this will greatly improve the working conditions in Duke's Hill South. In the Peach Tree Mine proper the development results are still unsatisfactory. The incline shaft which is being put down on the south-western section of the mine has disclosed oxidised reef, but the values so far are very low. In the Columbia Hill section of this mine new work has been started to open up the area south of the Iota section. So far, the ground is very broken, and a considerable amount of work will have to be done before any definite conclusion can be arrived at as to its value. At the Theta Mine prospects are, if anything, brighter than usual, as the bottom reef below the old workings in the top reef is continuing to disclose good values. Brown's Hill Mine is opening up very satisfactorily; the existence of two payable reefs 50 feet part is practically proved there. The Pilgrim's Creek section of this mine is at present in an unsatisfactory position. In one of the drives the reef has dipped below the water level, while in the other it is poor in value and very much broken. Graskop Mine continues to open up as well as ever, and in the lower south-west section the reef has now been struck, fair thickness and values being exposed.

The Old Beta.

The old Beta Mine is being reopened, and it is satisfactory to be able to report that in the old workings very little caving has taken place. The hanging wall is generally good, and practically no difficulty will be met in reopening the mine. Two old drives are being reopened, and a new drive is being put in from the Peach Tree Creek, about 400 feet north of these two drives, so that a large area of ground will be attacked from three points. A new prospecting party has also started work on the south side of the Beta, where it is hoped that the reef will extend. Further up, about two miles to the south of these workings, another prospecting party has recently started, and a reef is now being disclosed which, though at first giving indifferent values, has recently greatly improved. The fact that an apparently payable reef is now being opened up at a great distance south of the area in this section of the property which is at present being exploited, and which has, in the past, been profitably worked to a considerable extent, leads us to contemplate the possibility of valuable discoveries being made on the very large extension of outcrop on the farm Grootfontein. Some years ago a certain amount of prospecting was done in the Pilgrim's Creek for alluvial, but with discouraging results. Work has lately been resumed on this ground, and there appear to be considerable possibilities of valuable discoveries being made there and in the Blyde River above Pilgrim's Creek; in places remarkably high values have been obtained. In his last advices, the general manager speaks very hopefully of the prospects, but at this stage it is probably advisable not to say more than that.

At Elandsdrift there is nothing fresh to report. The ground in the dip section continues to open up well, but recently development has been somewhat hampered by trouble with the pumps. This has now been rectified and development operations have been resumed. Steps have been taken to prevent the recurrenc of this trouble. It has been decided to add five stamps, with the necessary additions and alterations to the cyanide works at this mine. Final estimates have not yet been made, but the cost will be in the neighbourhood of £6,000. This addition will enable us to maintain the rate of profit, which might otherwise be adversely affected by the reduction in grade which is anticipated in the "blow." At Vaalhoek, the river section is continuing to open up well, but unfortunately the reef has dipped below the water level. Alterations are being effected in the pumping plant to deal with this. An additional tube mill will be installed here and the slimes plant will be enlarged, which will greatly improve the extraction and tend to economy in working. Here again final figures are not ready yet, but the capital expenditure involved will amount to some £4,500, while to provide for the economical working of the river section an expenditure of about an additional £1,800 will be required. There is nothing fresh to report in regard to outside prospecting.

General Manager's Belief.

Summarising the position, the general manager is able to report that in his opinion the prospects of the company have considerably improved since he wrote his last annual report, which is now before us. He regards the prospecting work which is now in operation in the central section, thanks to the present satisfactory labour supply, as affording hopeful indications of the possibility of the discovery of new payable mines there. The profits earned during the five months ended August of the current financial year have amounted to £108,165, while only £114 has been spent on capital account on construction. As I have indicated, provision must be made to meet the proposed extra expenditure at Vaalhoek and Elandsdrift, amounting with small items elsewhere to some £12,700 in all. Advantage has been taken of the comparatively low price at which our debentures have recently stood to effect substantial purchases; altogether about £12,000 worth have been bought during this financial year, and we shall continue to purchase as occasion offers. It is anticipated that the recent average profits will be maintained per this month and the board has therefore just declared an interim dividend of 17½ per cent. for the current half-year. Allowing for the proportion of debentures actually redeemable this half-year, that represents a declaration of the full net profit earned. I draw attention to this fact as I notice that some shareholders at the meeting of our European shareholders recently held in London rather urged the payment of larger dividends. I trust that shareholders generally will share the view of the board that our balance of cash in hand should be maintained and not be encroached on except possibly for the purchase of debentures, for expenditure on necessary construction, and, if the opportunity offers, for increased prospecting and development of our large property.

The War and Supplies.

At the outbreak of war we had three months' supply of cyanide in hand and adequate supplies of all other necessary stores. We have every reason to believe that owing to the steps which have been taken our operations will continue without any interruption. Satisfactory arrangements have been made for realising the value of the gold won during the period when shipments will not be made. Before concluding, I must record the board's appreciation of the valuable services which Mr. Aimetti has continued to render to the company; to him, to Mr. Carter, who acted as general manager very efficiently during Mr. Aimetti's recent absence on leave, to Mr. Patrick and Mr. Tute and their respective staffs our thanks are due for the efficient manner in which the company's affairs continue to be conducted.

I beg to move the adoption of the reports and accounts for the year ended the 31st of March, 1914.

Mr. Gill seconded the motion, which was carried.

The retiring directors, Messrs. A. E. Wallers and B. T. Bourke, were re-elected; the auditors were reappointed and the proceedings concluded.

Mining Company's Donation to Belgian Fund.

Several mining companies have made handsome donations to the National Relief Fund, and now we learn of a cheque for 250 guineas having been sent by the directors of the Globe and Phoenix Gold Mining Company to the fund being raised to relieve distress in Belgium. In the letter sent with the cheque to the Belgian Minister, Earl Russell, the Chairman of the Globe and Phoenix, remarks:—"I take this opportunity on behalf of myself and my colleagues of expressing the gratitude and admiration which they share with every British subject for the noble and brilliant defence of their country by your gallant countrymen—a defence which has benefited the entire civilised world. At the same time, they sympathise deeply with the sufferings of the Belgian nation, and gladly embrace this opportunity of giving their sympathy practical expression."

S.W. Diamond Fields.

Owing to the declaration of war and the consequent slump in diamonds, operations on the alluvial diggings in the South West Transvaal have been greatly restricted, and the output for August is probably the lowest since these diggings first came into public prominence. The returns, to which 30 fields contributed, aggregated 2,277⅛ carats, valued at £6,623 3s., as against 4,695⅞ carats, valued at £19,234 3s. 6d., for the preceding month. The following is a brief summary of the returns:

	Carats.	*Value.*
Bloemhof	$742\frac{5}{8}$	£1,869 16 0
Kameelkuil	$262\frac{3}{4}$	1,220 0 0
London	$298\frac{1}{4}$	765 6 0
Modderkraal	$54\frac{3}{8}$	441 15 0
Kareepan 164	140	339 12 6
Cawood's Hope	$108\frac{1}{4}$	308 10 0
Dievedraai	$85\frac{1}{4}$	214 17 6
Kareepan 137	$36\frac{3}{4}$	203 0 0
Eastleigh	128	202 10 0
Panfontein	108	165 15 0
Rietput	$56\frac{1}{4}$	151 5 0
Rondevlei and Doornbult ...	$23\frac{1}{2}$	100 0 0
Brandewynskuil	$15\frac{1}{4}$	94 10 0
Kuilfontein	57	94 8 6
Koppiesvlei	$15\frac{1}{4}$	76 15 0
Schweizer Reneke	$15\frac{7}{8}$	70 0 0
Christiana	$38\frac{1}{2}$	69 10 0
Olivenfontein	$16\frac{1}{4}$	54 0 0
Diamantdoorns	$14\frac{1}{2}$	37 10 0
Biesjeslaagte	$9\frac{1}{4}$	26 7 6
Mooifontein	7	25 0 0
Kromellenboog	$11\frac{1}{2}$	23 17 6
Avondster	$7\frac{3}{4}$	13 12 6
Goedgenoeg	$8\frac{1}{2}$	12 10 0
Zoetfontein	$4\frac{1}{4}$	12 0 0
Zwartlaagte	2	10 0 0
Blesbokfontein	6	8 10 0
Grootdoorns	$2\frac{1}{2}$	6 10 0
Goedehoop	$1\frac{1}{2}$	5 0 0
Klipkuil	$0\frac{1}{4}$	0 15 0
	$2{,}277\frac{1}{8}$	£6,623 3 0

For the past eight months the returns have been as follows:—

	Carats.	*Value.*
January	$3{,}063\frac{3}{4}$	£12,348 5 0
February	$3{,}858\frac{1}{8}$	16,167 2 9
March	$3{,}605\frac{1}{4}$	18,159 0 0
April	$1{,}196\frac{1}{4}$	18,415 6 0
May	$1{,}226\frac{3}{8}$	18,738 18 6
June	$3{,}549\frac{5}{8}$	15,984 17 6
July	$4{,}695\frac{7}{8}$	19,234 3 6
August	$2{,}277\frac{1}{8}$	6,623 3 0
	$29{,}712\frac{5}{8}$	£125,670 16 0

New Patents.

291. John Christian Reul.—Carboloos, a compound powder for preventing the formation of carbon in motor engines.
292. Gotthilf Ansgarius Betulander and Nils Gunnar Palmgren.—Improvements in automatic or semi-automatic telephone exchange systems.
293. Aubrey George Eneas.—Improvements in or relating to spray nozzle and method of distributing liquids.
294. Arthur Reginald August.—Improvements in or relating to railway safe running devices, "A.X."
295. Seguin Fisher.—Improvements in passing fluids into reciprocating rock-drilling tools.
296. Ambrose Spindley.—Improved clamp for boring water mains.
297. John Pountney Udal.—Improvements in blasting cartridges.
298. James West and John Edward Jones.—Improvements in valves used in jigging and other similar machines.
299. Charles Hansen.—Improvements in attachments for rock-drills for supplying water thereto.
300. John Mills Huxtable.—An appliance to facilitate the blasting of fuses used in blasting operations and to increase safety.
301. Eduard Ruegger.—Automatic lubricating device for compressors.
302. Herman Alexander Wagner.—Improvements in and relating to process of separating metals from ores.
303. John Sellers Bancroft and Mauritz Christian Indahl.—Improvements in or relating to galley mechanism for type composing machines.
304. Otto Christian Claus Schluter.—Improvements in leaf hinges.
305. Seguin Fisher.—Automatic water supply for hollow rock drills.
306. Thomas Henry Bradbury.—Improvements in and relating to rock drills.
307. William Bruce Paterson.—Improvements in jockeys or rope grips for mechanical haulages and the like.
308. Charles Hosking.—A music stand and walking stick combined.
309. James Hamilton Anstruther Macadam and John Thirwell.—Improvements in rock drilling machines.
310. James Hamilton Anstruther Macadam and John Thirwell.—Improvements in rock drill cradles.
311. Harry August Stockman.—Improvements in concentrators or machines applicable for separating particles of metal or precious stones from the matter associated therewith.
312. William Barnard Easton.—Improvements in tube mills.
313. Thomas Harrison and Daniel Corlett.—An improved type of self-lubricating roller.
314. Cecil Doveton Dunlop Helps.—Improvements in soil working implements.
315. Charles Bemant.—Improvements relating to the manufacture of drill steels and similar tools.
316. Charles Bemant.—Improvements relating to the manufacture of drill steels and similar tools.
317. Charles William Tozer.—Improved construction of retort for the distillation, carbonization and the like of coal and other carbonaceous materials.
318. Orville John Parker.—Improved process for treating carbonaceous material.
319. Jean Charles Griere.—A process and apparatus for the manufacture of dry sugar in grains, moulded sugar, sugared products or chemical products without centrifuging and without drains.
320. John van Hostrand Dorr.—Apparatus for the separation of finely divided solids from liquids.
321. Francis J. Hobson and Charles Edward Beyer.—Improvements in ore separators.
322. Henry Moore Sutton, Walter Livingston Steele and Edwin Goodwin Steele.—Improvements in processes of and apparatus for sizing and classifying comminuted materials.

INVESTORS' DIARY.

FORTHCOMING COMPANY MEETINGS.

Sept. 29.—National Bank (Pretoria).
Oct. 28.—Rooiberg Minerals.
Nov. 10.—Johannesburg Consolidated Investment Company.
Nov. 16.—Nourse Mines; New Modderfontein.
Nov. 20.—Glynn's Lydenburg.

THE SOUTH AFRICAN

Mining Journal,

WITH WHICH IS INCORPORATED

South African Mines, Commerce and Industries.

ESTABLISHED 1891.

VOL. XXIV., PART I.] OCTOBER 3, 1914. [No. 1201.

HEAD OFFICE: 176-180, Stock Exchange Buildings, Fox Street (2nd Floor), Johannesburg, Union of South Africa.

Telephone **913.** P.O. Boxes **963** and **418.**

Cable and Telegraphic Address: "**MINING JOURNAL.**"

AGENTS FOR GREAT BRITAIN: Argus Printing and Publishing Co., Ltd., Byron House, 82-85, Fleet Street, London, E.C.

AMERICA: Advertisements accepted from any recognised Advertisement Agency.

ANNUAL SUBSCRIPTION RATES: Oversea, £2; South Africa (by post), £1 10s.; Local Delivery (Town only), £1 6s.

Copies of this journal are obtainable at all Branches and Agencies of the Central News Agency, Ltd., at all News Agents and Railway Bookstalls throughout South Africa, and at the London Agency as above.

NOTICE.—The postage of this issue of the *S.A. Mining Journal* is: South Africa, ½d. All other parts, 1d.

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Notes and News.

The Industrial Outlook. It only needs the official confirmation of the President of the Chamber of Mines, quoted in another column, to emphasize that the position of the mining industry continues to be eminently satisfactory. The native labour prospects are every day improving. Working costs are not being increased, as the official figures for August testify. The Daggafontein strike is an excellent pointer for the whole Far East Rand. So healthy, indeed, is the situation that some advertisements of shares offered for sale in our last issue were promptly responded to, the replies revealing a strong bull position. After two months of war, indeed, the outlook could scarcely be brighter.

* * * *

August Profits and Costs. The total working profits of 51 companies on the Witwatersrand for August amounted to £988,567. The working costs were £1,875,367. During the eight months of 1914 these companies have declared dividends amounting to £4,055,226. The average working costs per ton milled were 16s. 8d., and the average profit 8s. 9d. In the outside districts nine companies made profits of £34,310 at a cost of £59,534. The average profits were 12s. 10d. per ton and the average costs were 22s. 4d. In the eight months of 1914 the outside districts declared profits of £117,503.

* * * *

Shamva Mine. The *Rhodesia Herald* is informed that owing to a serious accident to the main ore hoist, the large gear wheel of which (owing, apparently, to a flaw in the casting) got smashed up at the end of August, the whole mill of the Shamva mine has been completely hung up for the first fifteen days in September. Fortunately the company, having a foundry on the mine, were able to produce a satisfactory casting themselves, but owing to the war, supplies of pig iron have been unobtainable, which is against as satisfactory a casting being made as would otherwise have been the case. The mill was again running on the morning of the 15th inst.

* * * *

The Cornishman and his Natural Ability. Mr. J. McNaughton, the General Manager of the Calumet and Hecla Mining Company, one of the largest copper producers of the world, has a high opinion of Cornishmen, and his testimony will be endorsed on the Rand. When giving evidence before the Congressional Committee investigating the recent strike of copper miners in Michigan, Mr. MacNaughton explained why so many of the "bosses" employed by his company were "Cousin Jacks." The Cornishmen, he said, inherited mining from generations of ancestors, while apart from the fact of their being good miners, when they reached America they spoke English and thus had an advantage over a great many foreigners, such as the Austrians, the Italians and the Finns, who were handicapped by reason of their inability to speak and understand English readily for some time after their arrival. Mr. MacNaughton remarked that the charge to the effect that the majority of underground bosses and captains were Cornish probably was right.

* * * *

Union Manufacturers' Opportunity. The South African National Union has issued an opportune manifesto urging manufacturers in this country to seize the opportunity afforded by the war for developing their business. For some time the factories of the principal industrial countries on the Continent of Europe will be unable to supply any of the goods that South Africa has been accustomed to purchase from them. In Belgium industries are completely at a standstill. Germany and Austria, even apart from the dislocation of business caused by the war, could not export goods to this country, because we are at war with them. In France the general mobilisation has taken enormous numbers of men away from the factories, and production must necessarily be greatly diminished in consequence. The United Kingdom is more happily situated, by reason of the fact that its chief contribution to the fighting forces is its Navy; but some diminution of production for export may be expected. The mills of neutral countries, in particular those of the United States, will be working at full pressure, but their surplus output will go to meet the deficiency in European production. To a greater extent than usual, therefore, South Africa will be thrown upon its own resources. On the other hand, it must be reckoned that manufacturers in the United Kingdom and in the United States will put forward special efforts to secure new custom in the temporary absence of Continental competition, and in some cases the closing of Continental markets will enable them to dump their goods in the markets which are open to them.

*   *   *   *

Kleinfontein Estates.

Col. Dalrymple, presiding this week at the annual meeting of the Kleinfontein Estates and Township, Ltd., said that the gross profit for the year from all sources amounted to £9,270. During the year interim dividends amounting to £12,750 had been declared. Despite the differences over the industrial question, the community of Benoni had to take every credit to themselves for placing their differences aside for the time being and co-operating in the call for men and material to combat the foes of the country. Great credit was due to the public-spirited Mayor, Mr. George Rennie, for immediately placing his business and municipal affairs aside and taking his squadron of the Imperial Light Horse to the front. On the motion of Col. Dalrymple, seconded by Mr. Marais, a sum of £50 was voted to Mr. Rennie for the provision of comforts for his squadron.

*   *   *   *

The Zinc Smelting Question.

A recent issues of the London *Mining Journal* publishes the following interesting statement by a gentleman prominently connected with the zinc business:—"Fifty thousand tons of spelter are produced annually in Britain and 120,000 tons are used. [The figures given in the last report of the Frankfurt Metallgeselschaft are somewhat larger than these. Thus production in the United Kingdom in 1913 is stated at 59,146 tonnes, imports at 147,300 tonnes, and consumption at 194,600 tonnes.] The balance is dependent on German smelting of English concentrates, coming from Australia very largely. Now the Broken Hill and other Australasian ports have been shipping to the German smelters concentrates, roughly, 180,000 tons of spelter. The net position is that spelter is at a high price at the present time because there is not an English supply. A zinc smelting industry ought to have been established in this country long since. This has not been done owing to the lack of technical efficiency and enterprise among English metallurgical people at Swansea and elsewhere. They have let this trade get out of their hands. The English companies producing zinc concentrates are nearly all mining companies, who do not want to go into the metallurgical end of it, and the Englishman has failed hitherto to rise to the demands for smelting facilities. A number of English companies engaged in the production of zinc concentrates are now considering the question of establishing their own zinc smelters in this country. Nothing definite has yet been done because nothing can be done to finance them at the moment; but plans are being got out and the question of sites and locations studied. One great difficulty in the establishment of a zinc industry is the uncertainty of labour."

*   *   *   *

Railways and the Coal Mines.

Speaking at the annual meeting of the Coronation Collieries a few days ago, Major Bagot referred to the frequent stoppages occasioned by shortage of railway trucks. At a time like the present, he said, one was somewhat loth to criticise the Railway Administration. They had their difficulties to-day which are exceptional, but these difficulties had not prevailed during the period about which he wanted to speak. In the year previous the Coronation had been stopped for 309½ hours, owing to shortage of trucks. During the past year the stoppages through that cause had amounted to 300 hours; that was to say, an average of 25 hours per month, or approximately one hour per working day. A year ago the Railway Administration replied to their criticisms by submitting a list of new rolling stock purchased and on order, and referred to the fluctuations in the volume of trade in the Transvaal coal mines and the difficulty of keeping pace with the expansion taking place in the coal trade of the country. Let them take the last case first, the expansion of the coal trade. In 1911 the coal trade of the Union was approximately 7,595,000 tons, in 1912 it was 8,117,000 tons, and in 1913 8,801,000 tons. The increase of 1912 over 1911 was approximately 522,000, or just under 7 per cent. The increase of 1913 over 1912 was approximately 684,000 tons, or 8·4 per cent. It must be admitted that the expansion of trade had not been in excess of what might have been reasonably anticipated. Then take the fluctuations in the volume of the Transvaal coal trade. During twelve months ending the 30th of June, 1914, the average monthly output of the Transvaal collieries was 434,185 tons, and excluding January, when, owing to the strike, things were abnormal, in eight out of the remaining eleven months the output did not vary by more than 3½ per cent. from the figure. The list of rolling stock purchased and on order was intended to reassure them, but their experience, gained over a further twelve months, led them again to the conclusion that the rolling stock in the country to-day is, as it was twelve months ago, quite inadequate for dealing with the country's trade.

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Alien Control of Companies.

In the House of Commons, on Monday in mail week, Mr. Joynson-Hicks asked the President of the Board of Trade whether he was aware that Messrs. Siemens Brothers, under the title of the Siemens Dynamo Works, Ltd., were announcing publicly that they had received a contract to supply the British Government with electric lamps for the ensuing twelve months; and whether he was aware that though this business was registered in England as a limited company with £600,000 capital in 120,000 shares, these shares were largely the property of alien enemies, 70,465 being held by Arnold W. von Siemens, Karl von Siemens, and George von Siemens, all of Berlin, 19,783 by Alexander von Siemens, and 19,210 by G. von Chauvin, who was registered here as an alien enemy; and other blocks of shares were held by persons with German names, thus ensuring that practically the whole of the profits on such Government contracts, and other orders for cables, etc., which had been given by His Majesty's Government to this firm would, in the ordinary course, accrue to the advantage of these alien enemies; and whether he would take steps to ensure that a receiver be immediately appointed, so that while the plant and factories were used for the production of articles required in this country, so that British workmen should not be thrown out of work, there should be no profits sent during the currency of the war to the King's enemies. Mr. Runciman replied: I think the best answer I can give to the hon. member is to assure him that the general question of the position of limited companies in this country which are controlled by alien enemies is at the present time receiving the most careful consideration of His Majesty's Government. I cannot say more at present.

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Recruiting Activity.

South African financial and mining houses in London are not less enthusiastic than Johannesburg offices in rallying to the call for recruits. The banks are all allowing full pay, less army pay, to those volunteering, and they comprise all who can be spared. Many members of the London office staff of the Central Mining-Rand Mines Group have undertaken military service, while the Directors of the Anglo-French Exploration Company have informed their staff that those who enlist will have their positions kept open for them and their pay made up to the usual amount. From the London offices of the Neumann Group of Mines there has also been a considerable efflux of men. Sir Sigmund Neumann is helping City workers who desire to have instruction in drilling by placing at the disposal of a newly-formed corps the use of a large hall in Salisbury House, E.C. Every inducement is being offered to members of the East Rand Proprietary staff who are eligible to enlist, while others unable to participate in the actual campaign, for reasons of age or domestic causes, are rendering useful aid as special constables. There have been several applications for enrolment from the offices of the Consolidated Gold Fields of South Africa and A. Goerz and Co. Practically the whole of the eligible members of the Gold Fields London staff, to the number of about 30, have enlisted. Of seven members of the London staff of the Johannesburg Consolidated Investment Company who volunteered, six have been accepted, and have joined the colours. During their absence, the men will receive half pay, and they have been assured that their positions will be kept open for them. Before their departure for the war Mr. S. B. Joel addressed the men, expressing his admiration of their patriotic action, and, on behalf of the Johannesburg Consolidated Investment Company, presented each with a bonus of £5. We understand that Mr. S. B. Joel has placed his yacht, the Eileen, at the disposal of the Admiralty, but, owing to certain conditions which have to be fulfilled as regards equipment, the matter is still under discussion. Of the London office staff of the British South African Company, totalling 145, all the eligible members have either already joined the forces on active service or volunteered. Altogether 30 of the staff have enlisted. Permission is also being given members of the Rhodesian staff, who are at present in England on leave, to join the ranks if they feel so inclined. The London and Rhodesian Mining and Land Company have five men away on active service. Over thirty members of the staff of the Union-Castle Mail Steamship Company have either enlisted in the Army or joined the Naval Volunteers within the last ten days, and it is expected that many more will follow suit. Considerable numbers have also been recruited from the offices of the Clan Line Steamers, Ellerman and Bucknall Steamship Company, Blue Funnel Line, Harrison- Rennie Line, and Natal Line.

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How an Oil Field is Discovered.

Regarding oil, Professor Lewes, F.I.C., F.C.S., says:—"The discovery of an oilfield is brought about far more often by chance indications than by geological surveys, but when once the presence of oil in a district has been ascertained the aid of the geologist becomes of paramount importance. The surface indications, apart from seepages of oil, escape of natural gas from the soil, outcrops of oil-bearing strata, or deposits of bituminous character, are practically nil, but when any of these indications occur the geologist can generally determine if the likelihood of oil existing in quantity is sufficiently good to justify the expense of putting down a bore, and the most likely spot in which to do so. Oil scums on streams or pools and the infiltration of traces of oil into wells being sunk for water have been, perhaps, the most prolific sources of discovery, while the escape of natural gas from a fractured anticline, passing through wet alluvial and churning it up so as to form a mud volcano, has always been looked upon as a sign favourable to the presence of oil. When the strata has been much disturbed there is sometimes an outcrop of oil-bearing sand or limestone which, if recognised, will generally show traces of oil a few feet from the surface, while the existence of asphaltic or bituminous deposits, formed by the oxidation of petroleum escaping from disturbed strata, is often a valuable indication. In certain districts, especially in Galicia, deposits of a natural wax are found, called ozokerit, of much the same character as paraffin wax. In some oil districts where a slight leakage of petroleum has taken place from a fractured anticline the oil filtering up through the overlying strata becomes oxidised and converted into asphaltic and bituminous compounds of the character of those used for roadmaking. Where oil escaping from some underground source undergoes a natural process of distillation, which simply drives off from it the lighter portions, it forms a thick pitchlike residuum which forces its way into cavities and faults in the surrounding strata, and is found there as a black jetlike material, forming intrusive veins some little distance from the oil deposit that gives rise to it, such pure bitumens as manjak, gilsonite, etc., having been formed in this way."

TOPICS OF THE WEEK.

THE CHAMBER OF MINES AND THE WAR.

The quarterly meeting of the Transvaal Chamber of Mines on Monday last derived particular importance from the fact that it was the first held since the outbreak of war. The statements made by both Mr. Wallers, the President, and Mr. W. H. Dawe, one of the Vice-Presidents, are, therefore —for all of us interested in the industry—of unique and almost historic significance. Dealing with the paramount question of keeping the industry going, Mr. Wallers' remarks, though their tenour is not new, may be put on record.

> At the commencement of the war, the matters of the supply of essential stores for the mining industry and the disposal of our gold naturally claimed the very closest attention of your executive. It is with great pleasure that I am able to state that, with the very efficient and sympathetic help of the Government, both here and in London, every assistance has been given to the industry to enable us to ensure the continued working of the mines. The arrangements made in regard to mining supplies are satisfactory, and there is little doubt that sufficient supplies will come forward as required, although there may be a little temporary stringency at particular times, but nothing, as far as we can see, that should prevent us from carrying on operations at full blast. Most of the members of the Chamber have pooled their supplies of cyanide, mercury and zinc, and have entered into joint contracts for the supply of these articles for an appreciable period. As regards the question of mining supplies in general, I might add that we have at various times met the representatives of the Chambers of Commerce and Trade, and their attitude throughout the whole matter has been extremely helpful.

Mr. Wallers went on to show how the question of the disposal of the gold was a matter of vital importance. "The thanks of the mining industry," he said, "are due for the very excellent arrangements that have been made to our Government and the Imperial Government and to the South African banks—last, but not least—to the Bank of England, which has undertaken to purchase the gold produced by South Africa and permit drawings upon it in London, even when such gold remains in South Africa. The great importance of this far-sighted arrangement to the mining industry and to South Africa is obvious: it is of paramount importance to dispose of our gold. The value of the arrangement to the United Kingdom and to the Empire generally will also be clear to you, because I think we may say, without any undue self-importance, that the gold output of the Rand may prove a very material factor in the ultimate victory of the Allies. Before I leave this subject, I would like to express the thanks of the industry and acknowledgment of the great value of the assistance in all these matters that has been given to us by the action of the committee of groups in London, who have been instrumental in enabling us to arrive at our present position. That, gentlemen, is our extraordinarily fortunate industrial situation, while the greatest war in history is in progress. The unique protection of the British Fleet enables us to carry on our work without the slightest interruption, as far as one can see. There is no need to labour this point—our position is one that inspires us all with the liveliest sense of patriotic pride and gratitude." In conclusion, the President pointed out that the mining industry had been the first to come forward to offer half wages to the volunteers for service in German South-West Africa. At the same time, he urged upon all the duty of keeping the mines going "at full blast." He congratulated the country on the decision of General Botha to take command of the Union forces in the field, and wound up a striking speech with a fine tribute to the patriotism and public spirit of General Botha. Mr. Dawe seconded the President's remarks in equally happy and dignified terms, and the Chamber of Mines can be congratulated on rising worthily to the greatest crisis in the history of South Africa and the British Empire.

THE PROSPECTOR IN THE PILLORY

The unsuccessful prospector is fond, when airing his grievances, of laying the blame for his failure on the Government. It is not surprising, therefore, that the most damning indictment we have seen of the prospector in this country should come from a Government Inspector of Mines. Mr. J. E. Vaughan, Inspector for the Natal Province, is the author of this, and some of his strictures may usefully be quoted. Mr. Vaughan begins by describing mining in Natal, apart from coal mining, as *in extremis*. Prospectors themselves, he says, are to a large extent to blame for the present miserable condition of affairs. They will not get away from workings which have been prospected time and time again without success. The mines on which prospecting is taking place in Zululand have been worked intermittently for the past twenty-five years, while there are large areas, such as the Lower Umhlatuzi and Tugela Valleys, which are likely spots for discoveries to be made and which have never been properly prospected. "If only prospectors would get away from the old workings," he continues, "and examine new areas, discoveries of value might be made." The climate of Zululand, especially in winter, is almost ideal, and living on the veld is cheap. Among the sufferers from miners' phthisis there must be many with a knowledge of prospecting. If these men could be induced to give Zululand a trial they might improve their health and finances, but they must get away from the old places and try new areas. As an example, Mr. Vaughan quotes the fact that the banket beds of N'Kandhla are known to extend for forty miles; they are being prospected in one place, and that in the immediate neighbourhood of old workings. No one seems inclined to prospect in other parts of the same formation. He adds: "I know of no reason why the gold should be expected to concentrate itself in one spot." Mr. Vaughan goes on to show that some of the syndicates which are formed to work mining propositions are anything but beneficial to a mining industry. The partners quarrel amongst themselves, the syndicates come to a premature end, and in some cases the employees have been left without their wages. A point, which he strongly emphasizes, is the absurdity of buying and erecting a battery before the mine has been proved. Syndicates usually have meagre funds, and instead of developing their holdings, when if successful results were obtained they could obtain further funds or part with their properties at a profit, they waste their money by buying a battery. The battery starts up, anything is put through to keep it running, the funds are rapidly exhausted, and the gold recovered compared with the tonnage milled is of so little account that it is hopeless to attempt to raise further funds. In Zululand it appears to be "buy your battery and find your mine," not "prove your mine and then get your battery." What is wanted, according to Mr. Vaughan, is a party of practical men willing to work themselves and with a little capital so that they could purchase and erect a battery if they should discover a payable proposition. But nowadays people seem to prospect only with the idea of selling, not of working any discovery they might make. It is their aim to get out a few good samples and see if anyone will buy. One might almost think that prospectors are afraid to develop a property properly for fear of it going poor. Another way in which prospectors set out to undo themselves is that they will not take out one claim and prove that before taking out others, but they must take out at least a dozen claims, giving them a tract of country 223 acres in extent, on which they have to pay heavy fees and so exhaust their limited resources. Mr. Vaughan concludes with biting sarcasm: "A large number of mineral specimens have been identified in this office free of charge. There has been nothing remarkable about any of them, apart from the ingratitude of the persons on whose behalf the specimens were identified. In no case has any acknowledgment been made of the results of our tests. Applicants send in their specimens to be identified for nothing, but are much too indifferent to write and acknowledge the receipt telling them what the specimen was. From all one hears they expect the inspector to mistake iron pyrites for gold, and when he does not do so hold him up as an example of an incompetent Government official."

"SAFETY FIRST" AND RAND ACCIDENTS

Possibly the fact that the Rand "Safety First" movement started so late last year is responsible for its being almost ignored in the annual report of the Government Mining Engineer. One of the Inspectors of Mines, Mr. William Moses, does, however, make mention of it, and the following extract, quoted by the Government Mining Engineer from the report of Mr. Moses, pays a slight tribute to the new campaign against accidents. Mr. Moses writes:—"Some of the mines are still on the move towards reduced working costs, but at the majority of the mines, I am pleased to say, this is gradually giving way to 'Safety First,' and the rules and regulations are better enforced and considered by all concerned. The conditions of work, the general welfare and comfort of employees are gradually being improved by the managements." Apart from the Rand accident statistics and the general conclusions of the Government Mining Engineer thereon, recently quoted in these columns, Mr. Kotze has some sound advice to offer on the most prolific causes of mine accidents on the Rand. Some of his warnings may seem mere repetition of those contained in previous reports, notably that of the year before last, but it is plain that room for improvement still exists. Mr. Kotze shows that thirty per cent. of the fatalities in the Rand mines were due to falls of ground. The cause still requires a large amount of attention, and the subject one that has continually to be brought to the notice of managers. It is the duty of mine owners and their technical staffs to arrange for proper and safe support of mine workings without any interference on the part of Government officials, but in certain cases such dangerous conditions have resulted from the stoping of large unsupported areas that the Department has been obliged to interfere. Such direct interference will probably have to continue, since it is a common practice to postpone adequate measures until the last moment. The unusual strength of the hanging wall on the Rand appears to have gradually perverted the mining instincts of every one working in the mines. Elsewhere in the world the usual presumption of mining men is that the hanging wall will fall unless supported. Here the presumption is that it need not be supported unless there are obvious signs of its coming down. This fallacious idea is undoubtedly responsible for the large number of accidents from falls of hanging. Pack building is still unpopular, seldom systematic, and is carried out largely on the varying opinions of junior underground officials. The useful pack near the face is considered a nuisance on account of blasting and catching the fines and the ordinary stope pack is too frequently only slowly erected in odd time when there are natives to spare. There are, however, bright exceptions, the Modder "B," Brakpan Mines, Robinson Deep, and City and Suburban have done excellent work in packing heavy ground and exhausted areas. At Modder "B" the packing is exceptionally well done, the packs being filled in by experienced masons, and the fines do not get blasted into them. Splendid timbers are still found in drives and travelling ways, but too little temporary and permanent timber is found in stopes. It is not at all clear why the miner who on the Rand has practically no manual work to do, should not timber and set props in all cases, instead of waiting for a timberman. Lack of stulls below pillars has caused a considerable number of accidents during the past year. Proper stulling is required as nearly all pillars are under pressure and liable to crack and flake, and sweep the whole stope below when steeply inclined. The shift boss, once hardly recognised, has become a very important item in underground supervision. They take the place of mine policemen. It is frequently contended that this duty devolves on the Mines Department, but it is clear that since the enforcement of regulations involving issuing of orders, such a system would mean dual control which is impracticable. This and much more of a similar practical nature is emphasized in the reports of all the Reef Inspectors of Mines and will, doubtless, be taken to heart by all concerned.

MINING PROGRESS IN THE OUTSIDE DISTRICTS.

Review of Recent Developments in the Pilgrims Rest and Barberton Districts —Position of the Tin, Copper, Lead and Silver Industries.

In the course of his annual report, Mr. T. G. Trevor, Inspector of Mines, Pretoria, writes:—

GOLD.

Pilgrims Rest.—During the year under review there has been a slight decrease in the activity and output in this district. The returns for the first and last months of the year are as follows:—January, 1913.—Employees: Whites, 368; coloured, 5,701; fine gold, ounces won, 14,549·970. December, 1913.—Employees: Whites, 357; coloured, 4,933; fine gold, ounces won, 13,318·884.

Morgenzon.—The concession over this farm, which had been in existence for some thirty years, lapsed in the early part of the year. The celebrated Clewer Mine of the Transvaal Gold Mining Estates was situated on this farm. As far as it is possible to tell, the property was completely worked out by the company before the lapse of the concession, and it is doubtful whether there is anything left on the farm to justify further mining operations. The question of the disposal of the farm and mineral rights is still under consideration, and in the meantime the ground has not yet been proclaimed.

Transvaal Gold Mining Estates.—The position of this company remains very much as it was. There is ore development sufficient to continue working at the same rate of profit for the next two and a half years, and there is no reason to suppose that the developments in that period will prove disappointing. At the same time it must be acknowledged that the "Jubilee Hill" Section is practically finished, the Clewer abandoned, and the Theta coming to an end. Developments on the Columbia Hill, Duke's Hill and Brown Hill Sections are continuing satisfactory. The Vaalhoek Mine of this company has improved wonderfully in the last few months. The upper sections of the original mine near the mill are finished, but the lower or river section has developed phenomenally, and I understand the position of the mine is better than ever before. The Elandsdrift Mine continues as well as ever, and there seems to be every likelihood of its lasting for many years. The general prospecting done by this company has not given any encouraging results during the year. The power station has given thorough satisfaction.

C. M. B. Syndicate.—The C. M. B. Syndicate (Messrs. Cornwall, Burnham and Munro), to whom the Government advanced a sum of £2,000 odd for their electric connection to the Transvaal Gold Mining Estates' power line, started crushing with five stamps in October, and are turning out some 150 ounces per month. It is satisfactory to notice that they are fulfilling their engagement and repaying the capital and interest as the instalments fall due.

Alluvial.—Some rich alluvial gold has been struck on the summit of the Mauchsberg, near Mount Anderson, which has given rise to a rush of claim peggers. The gold occurs at horizon far above any of the older occurrences, and though I do not expect anything sensational from the alluvial it will be interesting to see from what source it has been derived. The tributors on the Spitzkop property, known as the G. H. L. Syndicate, have to everyone's surprise been doing extremely well.

Glynn's Lydenburg.—This company have practically finished their old mine, and will in future have to depend principally on the Werf Mynpacht. Development in this section has hitherto not disclosed ore of the consistently high value yielded by the old mine.

Rietfontein (T. C. L.), Ltd.—This mine, which is working a vertical reef in the granite, has met with great difficulties in its extraction. The gold occurs in pyritic masses, and though it will be doubtless found possible to treat these in a satisfactory manner as experiments proceed, up to the present the extraction has not been payable.

Barberton.—The position in the first and last months of the year in this district was as follows:—Employees: Whites, 297; coloured, 3,251; fine gold, ounces won, 7,169·755. December, 1913:—Employees: Whites, 293; coloured, 2,446; fine gold, ounces won, 7,011·510. The position here appears to be quite sound. The Rosetta has finally closed down, but the surviving mines are now on a sound basis and are doing well.

Sheba.—The position on this mine seems secure for several years to come from the developments on the Zwartkoppies Mine alone. Further researches into the old workings on the Sheba Hill are giving satisfactory results, and it seems extremely likely that a lot of the old workings on this hill may again be profitably reopened. The company have established a large generating station at the Sheba siding and thereby saving transport on the majority of the coal formerly used.

New Fortuna Mine.—This mine continues to do excellently, turning out about 700 ounces per month, and there are, so far as I know, no signs of its coming to an end.

Worcester.—This mine continues at its usual level of small but regular profits.

Consort.—The tributor on this mine still continues to do well, turning out about 400 ounces per month. He has succeeded in getting capital for his experiments in the treatment of concentrates, and is still confident of the power of his process to extract more gold from concentrates than is indicated by their assay value.

Kaapsche Hoop.—The alluvial workings here have attracted the attention of several miners' phthisis patients. These men have made a few pounds per month out of their alluvial work, while their health has phenomenally improved during their stay. Under these circumstances it has been proposed to form a miners' phthisis colony on the mountain, and the matter is, I believe, still under the consideration of the authorities. I am strongly in favour of the suggestion, and I trust that the industrial disputes of recent months have not resulted in the proposal being shelved *sine die*.

Prospecting.—The Transvaal Consolidated Lands Company have been prospecting on a large scale all over the Barberton and Steynsdorp areas, but have, I regret to say, failed to locate anything new or of obvious value. They have now withdrawn practically all their prospecting parties.

COPPER.

The shipments of copper concentrates and matte totalled 5,288·650 tons, valued approximately at £138,328, as against 1,619·480 tons of a value of £49,142 for the previous twelve months. This represents the output of the Messina (T.) Development Company, Ltd., solely, and the concentrates contained about 43·61 per cent. of pure metal. This gives an increase of 3,669 tons, value £89,186, over the previous year.

Messina.—The Messina have erected a new plant, including smelting furnaces, for reducing their middlings to a 50 per cent. regulus. The railway having arrived practically at Messina, the prospects of this company should advance by leaps and bounds, and three or four new mines may be expected to be developed in the next few years.

Motale.—Work at Motale has shut down, as the ore was not rich enough to overcome the difficulties inherent on the situation.

M'Tamba.—At M'Tamba good work has been put in, and a small lode developed which may or may not be payable, but I expect sooner or later that deposits of value will be found in this neighbourhood.

TIN.

The tin mines were responsible for the shipment of 3,600·494 tons of concentrates, valued at £427,863, which show an increase over the previous twelve months' output of 668·286 tons, valued at £60,164. This increase will probably be maintained and exceeded in the future as Leeuwpoort and Welgevonden have now joined the ranks of producers, and Stavoren and probably Mutua Fides will shortly follow. Zaaiplaats and Groenfontein have maintained their position, and the only failure has been that of the South African Tins on Doornhoek, which after a chequered career of misfortune has at last shut down owing to the death of all its chief supporters.

LEAD AND SILVER.

Note.—The Donerhoycul Tributing Syndicate, better known as Edendale Estates, closed down during the year, and there does not seem any immediate prospects of its reopening. The Transvaal Silver Mine disposed of some 395 tons of lead slime, yielding 79 tons of galena, valued at £1,199, and 8,690 ounces of fine silver, valued at £1,028. Sooner or later these mines are sure to be reopened, but the enormous amount of water encountered in the workings will preclude their ever being exploited on a small scale.

Metallurgy and the War.

In the course of an interview with a representative of the *Morning Post*, Mr. Sulman, of Messrs. Sulman & Picard, states:—"English metallurgy, with the exception of iron and steel, has been distanced in late years by America and Germany. Take the production of zinc. The production of the world's spelter is about 900,000 tons per annum, and of this only about 50,000 or 60,000 tons is produced in Wales. Belgium and Germany produce between 300,000 and 400,000 tons. The making of zinc was at one time almost entirely carried out by this country. One of the principal sources of supply was created by British metallurgists through a process of reducing and rendering available the zinc portions of the silver-zinc-lead ores of Broken Hill. English metallurgists found out a way of utilising the base reserves of these ores, which are now concentrated into valuable zinc products by means of oil flotation. These products also contain some lead and silver. Because of the backwardness of British smelting metallurgy these zinc concentrates are shipped in their entirety to the Continent. The industry is one which could be easily taken up again. Owing to the shutting up of the Continental smelters by the war the great Broken Hill mines are now closed down, though it is one of the greatest mining centres of the world. One of the many mines on Broken Hill is alone responsible for the production of zinc material capable of supplying a quarter of the whole world's output of zinc. Owing to the lock up of the German and Belgian smelters it is idle. With capital and enterprise up-to-date zinc smelting works could be erected in Wales and the whole of this trade recovered. English workmen would be able to reduce all the raw material which is now produced by Colonial and home owned mines. A curious fact is that Welsh coal is actually exported to the Continent for dealing with these ores. This is the original home of the zinc smelting industry, and it was only by want of up-to-date methods that we allowed Continental people, with greater care and more thoroughness than ourselves, to filch this trade from us. All that is wanted even now is metallurgical and financial enterprise. We have the skilled workers and we could regain it in such a way that we should never lose it again."

GERMAN OVERSEA TRADE EXPANSION AND THE PRESS.

Sir Edward Goschen Exposes Secret Organization to Influence the Papers.

The Foreign Office has issued as a Parliamentary White Paper despatches forwarded at various dates by the British Ambassador at Berlin (Sir Edward Goschen) respecting the establishment of an official German secret organization for the purpose of influencing the foreign Press in the interest of the German export trade and of the spread of German influence generally.

Sir Edward Goschen, in his first report on the subject, said for some time past a variety of schemes had been ventilated in the Press with the object of improving German prestige abroad. It was said that in certain foreign parts Germany was being persistently and wrongfully abused, that she could obtain no fair hearing because the Press of those distant countries was in hands hostile to any German enterprise and because the telegraphic agencies in those countries were equally biassed. In order to combat this a scheme was inaugurated to start a series of German societies beginning with a German-American Economic Society. There were to be a German Argentina Society. German-Canadian Society, German-Russian Society, etc. A preliminary meeting was held, but owing to internal dissensions this scheme fell through. Subsequently a meeting was held at the Foreign Office, the secret of which was well kept, at which the Foreign Secretary and head of the Official Press Bureau were present. It was attended by members of leading industrial concerns in the country, and they formed a private company with the conveniently vague purpose of "furthering the German industrial prestige abroad," and there were promises of £25.000 a year for the purpose. To this the Government was to add £12,000—the whole Secret Service fund at the disposal of the Imperial Foreign Office for the payment of subsidies to certain papers abroad. The company entered into an agreement with the Agence Havas that the latter would in future only publish news concerning Germany if supplied through Wolff's Telegraph Bureau. The latter would receive its German news exclusively from the new company. The company, it was reported, intended to make a similar arrangement with Reuter's Telegraph Bureau for those foreign countries in which Reuter controlled telegraphic communications. If Reuter declined the "Deutsche Kabelgesellschaft," a smaller German news agency, supplying telegrams from certain countries and working in agreement with Wolff's was to be financed by the new company to run a service in competition with Reuter's. All the concerns represented at the meeting, furthermore, agreed to pay into the company's hotch-pot the very vast sums which they are accustomed to spend abroad for their advertisements in foreign papers. The total of this item alone is believed to be not less than £25,000 per annum, so the annual sum available for the purpose of the new company will reach a total of £50.000 to £75,000. The company will in future issue the advertisements of its members only to those foreign papers which publish German information originating exclusively from the new company, which is to be regarded as the only authentic source of information concerning Germany and all things German. This information they are to receive free of cost or at a nominal sum, so that the willing foreign papers will derive very material benefits from their collaboration with the company—namely, lucrative advertisements and free matter written in the language of the country in which the papers are published. The German cable rates for Press telegrams were to be reduced in the interests of the new company. "It is difficult to say (continues the British Ambassador) whether the evil which the new company is to remedy really exists, or exists to any perceptible extent, but it is certain that a very influential private company has been called into existence with every official encouragement commanding an enormous revenue for the purpose of a pro-German newspaper propaganda. Whether the evil exists or not, the money will be spent on secret service to popularise Germany abroad. It does not seem to have occurred to the promoters of the scheme that they are preparing the ground for a vast system of international blackmail." In subsequent dispatches Sir Edward Goschen told of cheapening of cable rates at week ends in order to facilitate the dispatch of the desired "news" service, and forwarded translation of an article on the subject from a well-known commercial weekly, the "Deutsche Export Revue." This was so frank that the Ambassador says he was informed that an order was issued from high quarters forbidding the reproduction or reference to the article as it was "not unnaturally considered extremely inopportune and embarrassing."

The War and Patents.

We are now confronted with the proposal that all patents granted in this country to alien enemies should be forthwith revoked. In other words, that the property in this country of our enemies should, as it were, be thrown into the street, so that all who pass by may appropriate whatever they fancy. The proposition seems attractive, but there is, it should be remembered, a large patent property in Germany which belongs to British inventors. If we revoke all the patents belonging to the subjects of the States with which we are at war, we must expect that the Governments of these States will act in a similar manner as regards the patents held by us. Our gain would then be a good deal counterbalanced. The British Government do not propose any drastic measures, says *Engineering*, but have taken certain steps for the protection of British trade, and to that end have passed an Act (Patents, Designs and Trade Marks (Temporary Rules) Act, 1914) amending the Patents and Designs Act, 1907, and the Trade Marks Act, 1905, in a certain manner, and to have taken power to make rules and to do such things as they think expedient for avoiding or suspending, in whole or in part, any patent or licence granted to, and the registration of any trade mark the proprietor whereof is, a subject of any State at war with His Majesty. The Board of Trade has set up the necessary machinery to carry out the Act, and has issued rules from which it appears that they may, on the application of any person, and subject to such terms and conditions, if any, as they may think fit, order the avoidance or suspension of the rights of patent and registers of trade marks of aliens. The Board, before granting any such application, may require to be satisfied on three points. The first point of which the Board will require to be satisfied is that the patentee, licensee or proprietor is the subject of a State at war with His Majesty. This point looks very simple and easy of proof, but when the time comes it may raise difficulties that are not apparent to those who are not well posted as to the preparations of our enemies. The Board of Trade will no doubt rule and, indeed, we think they must do so—that the person appearing on the register as patentee, licensee or proprietor, must be regarded as such, and not a third party who may subsequently appear. The second point requiring proof is that the person applying intends to manufacture, or cause to be manufactured, the patented article, or to carry on, or cause to be carried on, the patented process, or intends to manufacture, or cause to be manufactured, the goods or any of them in respect of which the trade mark is granted. We cannot say what sort of proof the Board will require on this point, but it, and the third point, are evidently intended to prevent applications under the Act by persons who have no interest and are acting more or less as common informers. The third point on which the Board will require to be satisfied is that it is in the general interests of the country or of a section of the community, or of a trade, that such article should be manufactured, or such process carried on, or the registration of the trade mark avoided or suspended.

Base Metal Quotations.

The market report of Henry R. Merton & Co., Ltd., of 2 Metal Exchange Buildings, London, E.C., dated September 2nd, 1914, has the following, *inter alia:* The Metal Exchange, which was closed on Thursday evening, July 30th, has not been reopened. The following were the last prices then recorded:—Copper: Standard cash closing, £55 15s.; three months, £57 5s. Official quotations, 30th July. At 4 p.m.: Standard brands, £56 10s. to £56 15s. s. c.; and £58 to £58 5s. three months. Electrolytic £59 10s. to £60. Settlement price £56 10s. Refined sorts: Tough, £61 to £62; best selected, £62 to £63; electrolytic, £59 10s. to £60; strong sheets, £75; India sheets, £73; yellow metal sheets, 6⅝d. Tin: Standard cash closing, £132 5s.; three months, £135 5s. Official quotations, 30th July. At 4 p.m.: Standard quality, £132 to £132 10s. s. c.; £135 to £135 10s. three months. Settlement price: Standard quality, £133. Lead: Soft foreign, £17 15s. to £18 15s.; English, £18 10s. to £19 10s. Spelter: Ordinaries, £21 7s. 6d. to £21 10s.; specials, £22 to £22 5s. Antimony: £28. Aluminium: £81 to £85. Quicksilver: Spanish, £6 15s. per bottle first hands. Iron: In Glasgow business was transacted in Middlesbro' iron during the month of August at prices ranging between 50s. 11d. and 53s. 6d. for cash. The closing price on August 31st being 51s. 5d. cash, 51s. 7d. one month, and 52s. three months. Silver: Quotations during August ranged between 23⅞d. and 27¼d. cash; to-day's price being 24d. cash. The Committee of the London Metal Exchange has passed the following resolutions, among others:—"The settlement fixed on the 30th July shall hold good until the rooms are reopened and fresh settlement prices are fixed. Options between members, if exercised, must be declared on the date stipulated in the contract. Members having contracts with German or Austrian firms or individuals should, if they deem fit, close out all such transactions forthwith at the settlement price fixed on 30th July. Parties having open basis contracts are invited to agree forthwith to settle up on the prices to be fixed by the Committee, in view of the fact that no quotations are available by the usual channels. The following official B.S. quotations have been fixed for each Tuesday and Friday: July 31st, £60—£61; August 4th, £60—£61; August 7th, £64 10s.—£65 10s.; August 11th, £65—£66; August 14th, £64—£65; August 18th, £63—£64; August 21st, £61—£62; August 25th, £60—£61; August 28th, £59 10s.—£60 10s.; September 1st, £59 10s.—£60 10s. The Metal Exchange Committee have to-day fixed the following prices as constituting the average prices for the month of August, on which open basis contracts should be settled: Lead, £20 9s. 9d.; spelter, £29; electro copper, £62 10s. Copper Statistics: The European visible supplies on the 31st July, 1914, totalled 33,612 tons, and on the 31st August, 34,805 tons. Shipments: The American shipments from New York, Philadelphia and Baltimore for July were 34,145 tons, and for August 19,676 tons. Tin Statistics: The tin statistics for the month of August show a decrease of 275 tons.

THE DIAMOND DEPOSITS OF GERMAN SOUTH-WEST AFRICA.—IV

History and Description of the Discovery—Extent of the Fields—Topographical Details.

[BY DR. PERCY A. WAGNER.]

Transport. The question of transport, which at the outset also caused great difficulty, has been solved by the construction of light narrow-gauge railways. The Koloniale Bergbaugesellschaft has a line running down the centre of its claims from Kolmanskuppe to Elisabeth Bay, and the fields of the Kolmanskop Company are also linked up with Kolmanskuppe station. The Pomona and Bogenfels diggings are served by a light railway from Prince of Wales Bay, which has recently been connected with the Koloniale Bergbaugesellschaft line from Kolmanskuppe.

Power.—Most of the companies operating in the vicinity of Lüderitz Bay derive their power supply from a large electric generating station erected by the Koloniale Bergbaugesellschaft at Lüderitz Bay; current being transmitted at a pressure of 30,000 volts. The plants on the outlying claims are in most instances worked by large oil engines.

Labour.—All manual labour on the diamond fields is performed by natives and coloured workmen. The majority of the labourers, who number about 3,500, are Ovambos, recruited in the northern portion of G.S.W. Africa, but there are also employed well over 1,000 natives and coloured labourers from the Cape Colony; generally engaged on a six months' contract at a wage of £3 per mensem, with food.

Working costs vary considerably according to the scale on which operations are conducted and the situation of the claims. At Kolmanskop the total expenses per cubic metre of gravel washed—exclusive of administrative charges and depreciation—during 1912 amounted to 6·88 marks, equivalent to 6s. 8·7d. In the case of the Koloniale Bergbaugesellschaft, which is working on a more extensive scale, costs are somewhat lower. On some of the outlying claims, like those situated to the east of Bogenfels and at Frohe Hoffnung, operating expenses are, on the other hand, so high that the exploitation of gravel carrying over two carats of diamonds per cubic metre has in some instances proved unprofitable. The cost of production per carat, which naturally depends not only upon the operating costs but upon the diamond content of the material worked, ranges from about 1s. 6d. the case of the rich Pomona deposits to 15s. in the case of the Bogenfels and Frohe Hoffnung claims of the Deutsche Diamant-Gesellschaft. Even the latter figure compares favourably with the cost of production at most of the mines in British South Africa; and were it not for the small average weight of the diamonds which they produce, the discovery of the G.S.W. African field must have wrought havoc with the Union diamond industry.

Taxation.—During 1912, the original system of taxation, under which imposts and royalties claimed from 46⅙ to 50 11-12 per cent. of the gross value of the diamonds produced, has been transformed into a profit tax. Under the new arrangement the Government exacts 66 per cent. of the total value of the diamonds sold, less 70 per cent. of the cost of production; plus 2 per cent. of the total revenue on behalf of the Diamond Regie; the working costs to include an allowance of 10 per cent. of the amount spent and not written off on plant and machinery. Assuming, for example, that a company produces diamonds to the value of £10,000, and that the total working costs, including the 10 per cent. allowance, amount to £4,000, the tax is £6,000 – £2,800 + £200 = £4,000, or 40 per cent. When the cost of production amounts to 95 per cent. or more of the total revenue, no tax is payable. This reform in the method of taxation has had most far-reaching results; for while under the old system it paid the companies best to work off the rich patches of gravel and to leave the poorer deposits alone, under the new system it is far more profitable to exploit the rich and poor material together in a rational manner. The new tax has accordingly led to the adoption of a wholesale policy of mining, in place of the selective policy previously practised.

Disposal of Diamonds.—Since January, 1909, when an Imperial Edict was issued establishing a Government monopoly of the trade of diamonds in G.S.W. Africa, producers have been compelled to sell their diamonds through a Government organisation in Berlin known as the Diamant Regie. The Regie originally charged a commission of 5 per cent. on sales, but more recently this has been reduced to 2 per cent. The producer on handing in his diamonds to the representatives of the Regie at Lüderitz Bay receives 12 marks per carat on account, and the balance due to him, after deducting the Government tax and the Regie's commission, is paid when the stones have been sold. Until June, 1913, the Regie had been selling the diamonds by private *entente* to an Antwerp syndicate, headed by the firm of Coetermanns, and not on the open market. The price obtained per carat during the first months of 1913 was only 29·50 marks, and the producers, realising that they were not getting anything like market value, brought pressure to bear on the Government, which to put the matter to the test agreed to call for tenders for 1,000,000 carats. The London Diamond Buying Syndicate promptly made an offer of 45 marks per carat, but were outbid by the Antwerp Syndicate, which got the diamonds for 46 marks. The considerable increase in the price tendered was due in part, without doubt, to the competition of the London Syndicate and in part to the fact that since the beginning of 1913 a considerable proportion of the output of the G.S.W. African field has been derived from the Pomona area, where, as previously pointed out, the diamonds attain a maximum weight average weight and value. Owing to the slump in the diamond market during the latter half of 1913, the Antwerp Syndicate has not been able to dispose of the diamonds as rapidly as was anticipated, and since the producers made no attempt to reduce their output, the Regie at the end of the year found itself with huge stocks of unsold diamonds on hand. The knowledge of this fact further depressed the market in small stones, and the Government, realising the gravity of the situation, took definite action in the matter of restricting production. An Official Decree recently published lays down that every year the Diamond Regie will fix the number of carats allowed to be sold during the following year. The number will be subject to the state of the market and the condition of the industry. Each producer's quota will be officially determined. A producer can have his quota transferred wholly or in part to any other producer who is entered on the quota list. At the same time the Diamond Regie, on the board of which all the important companies have hitherto had representatives, will be converted wholly into a State enterprise. As yet the extent to which the output is to be restricted has not been announced, but, according to statements which have appeared in the Berlin Press, will be limited to about 1,000,000 carats per annum.

THE FUTURE OF THE G.S.W. AFRICAN DIAMOND FIELD.

Notwithstanding the fact that an enormous amount of prospecting work has been carried out by the different companies, no imoprtant gravel deposits have been discovered in the littoral of German S.W. Africa since 1910, and the area of the field is therefore not at all likely to be increased. With regard to the claims now being worked, it may safely be affirmed that, except in so far as the Pomona area is concerned, the cream has been skimmed; or, in other words, that the richest and most accessible areas of gravel have been worked out. The deposits in the Ida Tal at Pomona, while of phenomenal richness, are very shallow and of limited extent, and their importance appears to have been greatly overrated. As against the foregoing, there can be no question that vast resources, in the form of low grade gravel, are still available; and now that the exploitation of this material has been rendered feasible by the new method of taxation, and the Government has wisely decided to keep the output within reasonable limits, a long and prosperous career may confidently be predicted for the German diamond industry.

THE DIAMONDIFEROUS DEPOSITS ON THE GUANO ISLANDS.

During 1910 certain of the small Guano Islands, situated off the coast of G.S.W. Africa, which belong to the Union of South Africa, were prospected for diamonds by an expedition sent out by the Union Government. The islands examined were: Possession, situated about latitude 27° south, on which some eight months' work was carried out; Halifax Island, twenty miles further north, where fourteen days' work was done; Penguin and Pomona, each one day; Ichaboe and Seal were also visited, but no actual work was done on these. Possession Island produced 223½ carats of diamonds, of a value of £511 10s. Approximately 3,000 loads (16 cubic feet) of gravel were treated from various areas of this island, but continuous work was only carried out on the southern claims, 60 feet by 30 feet, averaging about 5 feet deep, was found. In a belt running east and west for 300 feet and about 20 feet wide, immediately above high-water mark, and parallel with that mark, 180 carats of diamonds were found, though north and south of this belt few diamonds were recovered. Owing to the difficulties of working these deposits, and the great expense involved, it was decided to abandon this island and examine some of the others. On Penguin Island the usual characteristics of the Possession deposits—garnets, magnetite, etc.—were found, but no diamonds. Beyond a superficial examination no work was attempted on Ichaboe, which was covered with birds. Mercury Island was found to be devoid of gravel, except in the hole through the island known as Glory Hole, and which would be unworkable except at dead low water in the finest weather, conditions which, it is understood, are extremely rare. Sixteen days were spent at Halifax Island. During the first week six trenches of a total length of 284 feet, averaging 5 feet deep to bed rock were put in, after which washing was carried on continuously for another week. These trenches traversed the whole width of the gravel bed, running south and north through the middle part of the island. The deposit here was considerably heavier than that on the other islands, but no diamonds were found. The total expenditure incurred in connection with the prospecting operations amounted to £3,257 6s. 7d., while the total value of the diamonds found was £511 10s., and it was therefore very wisely decided to leave the penguins undisturbed.

MINING INSTITUTE.
TEACHING CENTRES:—{ JOHANNESBURG AND SCHOOL OF MINES, KIMBERLEY.

Prof. YATES prepares candidates for the following Government Certificates:—
MINE MANAGER'S.
MINE OVERSEER'S
MECHANICAL ENGINEER'S.
ELECTRICAL ENGINEER'S.
MINE SURVEYOR'S
by Class Private Tuition, and Correspondence.

SOME 1914 RESULTS:—
MANAGERS - - - January and May - - ALL Passed.
ELEC. ENGINEERS - February - - - - 66% "
MECH ENGINEERS - June (Kimberley Centre) - - ALL "
MINE OVERSEERS - - - - - Practically ALL "
NEARLY 200 SUCCESSES. St. James' Mansions, Eloff Street.

RHODESIA'S MINERAL OUTPUT IN AUGUST

A Record—Increase of £8,820 on July the Previous Best.

We have received for publication from the office of the Rhodesia Chamber of Mines (Incorporated) the following detailed statement of the mineral output for the month of August, 1914, with comparisons and values:—

MATABELELAND.

	No. of Stamps.	Tons Treated.	Yield. ozs.	Value. £
Bulawayo District—				
Abercorn (W. J. Lane) ...	5	165	84·70	351
Alexandra (J. Stewart), July	2	160	46·25	192
Do. (clean up)	—	—	7·79	32
Antelope G.M. (Rhod.), Ltd.	2BM2P1T	4.081	1,263·80	5,239
Do. (sands)	—	3,673	1.092·89	4,531
Antenior	5	240	43·35	180
Do. (sands)	–	302	37·33	155
Athens (Triggs & Huntley)	5	400	187·57	778
Avoca (Est. R. Barkley)	10	551	105·49	437
Do. (sands)	—	325	14·66	61
Balkan (J. A. Warwick), July	5	290	34·50	143
Do. (sands)	—	80	9·71	40
Bash (Morrison & Granger)	5	260	122 97	510
Bassick (Bassick Syndicate)	5	75	73·67	305
Blue (J. Eisenhammer)	2	4	12·07	50
Bobs (F. W. Spencer)	1C	720	77·43	321
Borrow (W. H. Robinson)	2	332	47·09	195
Bucks Reef G.M. (J. Black)	5	876	298·15	1.236
Do. (sands)	—	398	59·47	246
Bulawayo Main A. (R. Aserman) ...	2	112	45·82	190
Bushtick Mines, Ltd.	20 3T	6,456	221·36	918
Do. (sands)	—	3,388	430·18	1,783
Do. (slimes)	—	3,023	201·23	834
"C.T." (D. & C. Syndicate)	10 1C	1,656	81·64	338
Do (sands)	—	1,424	127·33	528
Do. (slimes)	—	232	55·23	229
Camp (Carson Gold Mines)	5	330	51·14	212
Claremont Mines (R.), Ltd. (B. L. Whyte)	7	930	63·72	268
Do. (sands)	—	150	8·92	37
Colleen Bawn (Rhodesia, Ltd.)	6 2P	1,030	92·56	384
Do. (sands)	—	400	88·87	368
Do. (slimes)	—	630	142·59	591
Cottage (E. R. Napper)	4	100	28·08	121
Criterion Gold Mines, Ltd.	10	1.557	319·32	1.324
Do. (sands)	—	1,218	65·89	273
Delhi (Delhi Syndicate)	3	20	5·28	22
Denove A. (W. K. Early)	3	20	13·91	58
Eagle A. (Macdonald & Co.)	10	1,054	266·37	1,104
Do. (sands)	—	393	46·50	193
Elumba A. (Cooper & Bosomworth)	5	600	132·27	548
Do. (sands)	—	300	72·18	299
Etoile (Triggs & Huntley)	(5)	168	41·46	172
Farvie (H. S. Henderson)	5	730	400·50	1,660
Do (sands)	—	439	15·72	65
Flora (E. E. Beecroft)	5	469	181·51	752
Formby (Baldwin & Nield)	3	169	101·39	420
Fred (Transvaal & Rhod. Est., Ltd.)	10 2P	1,800	840·90	3.485
Do. (sands)	—	1,800	421·34	1,747
Godwin (Barrett & Stacey)	5	148	231·28	959
Do. (sands)	—	126	12·08	50
Golden Butterfly (Wheeler, Davis and Rintoul)	5	495	77·61	322
Do. (concentrates)	—	2	7·72	32
Hairy Dog (J. O. Jansson)	(5)	14	9·36	39
Halley's Comet (Stevenson & Kerr)	5	10	9·45	39
clean up	—	—	8·43	32
Intabanndla (Est. B. Smallie)	5	295	49·33	204
Do. (sands)	—	260	23·96	99
Jameson (T. Berwitz)	2	180	39·55	164
Jeffs (Horton & Strong), July	3	62	65·56	272
Do (August)	—	95	137·89	572
Jumpers (J. P. McCay)	5	580	235·68	977
Do. (tailings)	—	300	81·68	339
Kameel (Yellow Jacket Synd.) ...	5	633	113·18	469
Do. (tailings)	—	985	63·86	265
L. (J. A. Warwick)	5	171	38·41	159
Little Beauty (T. A. Matthews)...	Pannings	1	17·91	74
Lone Hand (Armstrong, Furber & Alexander)	5	402	205·87	853
Do (tailings)	—	260	40·05	168
Lonely Reef G.M. Co., Ltd.	3 T 20	6,090	3,285·87	13,622
Long John (Susanna Mines, Ltd.)	—	1,470	109·15	452
Do. (tailings)	—	1,419	231·30	959
Mamba (Johnson & Fletcher)	5	35	29·38	122
Master Cecil (Branson & Scabbel)	3	35	14·77	61
Matabele Queen's Co., Ltd.	10	1,880	379·04	1,571
Do. (tailings)	—	1,820	346·16	1,435
Do. (slimes)	—	600	63·30	263
Mayfair (Hicks & Arbery)	5	620	169·79	704
Do. (tailings)	—	396	24·10	100
Minnie's Luck (Mrs. C. M. Reid), July	5	144	17·11	72
Do. (August)	—	185	26·99	112
Mystery (E. F. Clayton), tailings ...	—	220	9·32	39
New Eclipse (J. R. Stewart)	5	821	161·38	669
Do. (tailings)	-	310	37·39	155
Nicholson (H. Venning), tailings ...	—	1,250	3·69	15
Northern Star (Northern Star Syd.)	10	379	159·51	661
Do. (tailings)		360	10·40	43
Do. (by products)		—	4·07	17
Old Nic (Chart. & Gen. E. & F. Co., Ltd.)	15 4P	2.130	801·87	3,324
Do. (tailings)	—	1,231	168·87	700
Peach A. (Peach Synd.), tailings ...	—	262	38·18	158
Penzance (Penzance Tributing Syd.)	2	104	17·40	72
Do. (tailings)	—	52	33·19	138
Petrel (M. J. Rorke)	5	220	38·73	161
Princess 2 (C. A. Abbott)	2	147	48·84	202
Rhodesian Queen (J. Gilpin)	6	90	18·35	77
Riverside (R. Martindale)	2	32	10·28	43
Roan (Robinson & Berwitz)	4	400	74·10	307
Roman (Berwitz & Watson)	2	120	31·58	131
Rous I. (A. G. Hadingham), July	2	121	81·17	336
Do. (August)	—	45	16·85	70
Rubicon (Anglo-Rhodesian Development Co., Ltd .(July)	5	340	15·12	63
Do. (August)	—	120	17·13	71
Star and Star I. (Romola Nigel G.M. Co.)	5	251	80·60	334
Do. (tailings)	—	240	21·22	88
Teutonic (Macdonald & Bonshor) ...	5	370	547·96	2,272
Tuff Nut (King's Synd.), slimes ...	—	70	24·24	100
Do. (slags)	—	—	47·41	199
Umvoti (Henderson & Toshack)	2	125	52·64	218
Winifred (Exchange Syndicate)	5	510	178·13	738
Do. (tailings)	—	182	82·78	260
Zealandia (J. Millin)	5	60	13·47	56
Prospecting Pannings (Fereday)	—	—	3·38	14
Bulawayo district total			17,925·58	74,230
Gwelo District—				
Alderman (Williams & Woodger) ...	3	100	66·60	276
Ardpatrick (C. Maleham)	3	283	138·90	576
Bedad	5	300	56·75	235
Do. (sands)	—	390	16·91	70
Bell Reef Dev. Co., Ltd.	2B 1T	3,684	1,587·45	6,667
Bonsor (Cornish Syndicate)	20	3,200	168·73	699
Bonsor (T. Roberts)	10	450	57 39	238
Camelia B. (S. Levin)	10	951	205·00	850
Do. (sands)	—	700	47·79	198
Cactus (Renton & Gray), July	5	400	94·75	393
Do. (sands)	—	380	73·24	304
Do. (August)	—	390	74·88	310
Do. (sands)	—	368	49·70	206
Cinderella (P. Burt)	1EC	360	24·65	102
Cissy (G. Nicholson)	1H	105	38·10	158
Collingwood (Pini & Wearing)	5	412	153·16	635
Csardas (Wolfshall Syndicate)	10	500	555·16	2.301
Do. (sands)	—	363	109·88	455
Do. (slimes)	—	137	26·70	111
Dunraven (New Dunraven G.M.) ...	5	700	109·54	454
Do. (sands)	—	720	53·76	223
Eileen (M. L. Price)	5	500	68·35	284
Falcon Mines, Ltd.	12 1T	12,790	932 00	3,728
Fenella (J. Kinrade)	5	25	20·82	86
Gaika G.M. Co., Ltd.	5 1C	3,330	1,487·88	6,249
Do. (sands)	—	1.597	133·99	563
Do. (slimes)	—	2.210	175·34	736
Glen Rosa I. (D. H. Curry)	2	130	241·37	1,000
Do. (sands)	—	250	205·89	854
Globe & Phoenix G.M. Co., Ltd. ...	40 10P	6,094	7,060·91	29,656
Do. (sands)	—	5.758	1,365·14	5,734
Do. (slimes)	—	2.316	646·64	2.716
Do. (concentrates)	—	344	537·95	2,259
Do. (by-products)	—	—	291·23	1,223
Gothic & Pagamesa (Mashonaland Ageney, Ltd.)	15 2P	1,704	475·94	1,973
Do. (sands)	—	1,320	217·33	902
Gretna Green (M. L. Price), June, sands	—	120	14·96	63
Invulnerable (W. H. Steele)	5	142	37·82	156
Kaka Main (I. Maleham)	5	394	95·85	397
Kings (P. S. Warden), slimes	—	388	85·63	355
Maise Luck (J. Jones), clean up ...	2	249	38·11	158
Meg (J. M. Havnar)	—	—	25·65	107
Moss (W. M. James)	2	409	251·89	1,044

	No. of Stamps.	Tons Treated.	Yield. ozs.	Value. £
Do. (sands)	—	502	35·49	147
Multum (W. Cock)	2	120	8·95	37
Nantwich (B. Frau)	(3)	148	38·43	159
Paradox (J. T. Woods), sands		450	20·14	83
Pretty Polly (Rhodesia G.M. Investment Co., Ltd.)	5	456	51·83	215
Do. (sands)	--	200	22·61	93
Redhill (Redhill Dev. Synd., Ltd.)	1 C	3,818	56·90	236
Do. (sands)	–	1,696	78·47	325
Shannon (A. Malcolm)	5	90	24·66	103
Somerset (F. C. Luxat)	2	310	112·92	468
Do. (sands)		200	43 95	183
Snowed Up 1 S.E. (E. A. Begbie)	5	177	72·82	303
Spiral (C. C. Stack)	2	20	18·86	78
Tebekwe B. 81 (A. N. Tyrrell)	15	383	100·66	417
Tebekwe 1 (A. N. Tyrrell)	(15)	1,727	303·97	1.260
Do. (sands)	--	1,000	26·95	112
Taxul (F. C. Luxat)	2	874	156·90	650
Do. (sands)		609	43·74	182
Wait and See (Hughes, Sumner and Straub)	2	70	18·34	76
Wanderer (Selukwe) G.M., Ltd.	4GR	11,020	1,443·97	5,986
Watch (J. Pedlow), clean up	—	—	15·23	63
Yankee Doodle (Bruhns & Schwarz)	10	1,346	159·98	663
Do. (sands)	—	994	101·82	423
Gwelo district total			21,082·52	87,986

Matabeleland total 39,003·10 ozs.
Value £162,216

MASHONALAND.

HARTLEY DISTRICT—

	No. of Stamps.	Tons Treated.	Yield. ozs.	Value. £
Acorn Gold Mines, Ltd.	5	567	159·64	662
Do. (sands)	—	360	56·49	234
Agnes (P. S. Triggs)	5	517	164·22	681
Do. (sands)	--	328	16·90	70
Baltimore & Virginia (P. Enke)	1 Pn.	280	41·80	173
Blue Rock (Blue Rock Synd.)	2	120	49·43	205
Brilliant (Mabel's Luck Synd.)	5 1P	955	433·55	1,797
Do. (sands)	—	466	126·88	526
Do. (slimes)	—	489		
Brompton (R. B. Aitken)	5	800	120·81	501
Do. (sands)	—	575	65·92	273
Cheshire Cat (Arnold & Windley)	5 1P	287	127·29	523
Do. (sands)	—	261	45·92	190
Do. (slimes)	--	209	29 87	124
Chadshunt (C. H. Wheildon)	5	181	166·59	691
Do. (sands)	—	121	43·84	182
Concession & W. Ext. (C. E. Simpson)	—	863	210·61	885
Concession Hill (C. E. Simpson)	5 1C 2P	2,179	248·95	1,021
Do. (sands)	—	1,725	128·15	531
Central C. (M. Price)	5	43	58·73	243
Dalny (Macdonald & Sale)	5	860	64·63	268
Do. (sands)	—	375	51·27	213
Dalny 1 W.	5	681	69 81	289
Do. (sands)	—	450	114·56	475
Dreadnought (W. E. Masters)	1C	234	47·16	195
Eiffel Blue (Willoughby's Cons. Co., Ltd.)	10	1,364	166·55	2,763
Do. (sands)	—	868	45·94	190
Eileen Alannah Mining Co., Ltd.	10	2.087	1,029·39	4.267
Enney Ext. (Ellsmoor & Goodyer)	5	520	83·16	345
Giant Mines of Rhodesia, Ltd.	30 2T	3.820	855·72	3,630
Glencairn (Glenrosa Mines)	5	520	240·40	997
Golden Valley (J. Mack)	10	1.305	953·36	3 952
Do. (sands)	—	700	142·08	589
Guelph (J. Davidson)	3	40	17·09	71
Glasgow Mines, Ltd.	5	494	181·54	753
Do. (sands)	—	300	71·98	298
Hepworth (L. Heilman)	2	87	55·75	231
Inez (Harrill & Smith)	10	1.000	208·01	862
Do. (sands)		760	62·09	657
Jessie Palmer (Crown Synd.)	2	150	34·14	142
Do. (sands)		120	23·71	93
Johnnie's Folly (G. R. Laws)	5	57	31 33	130
Kanyemba (Kanyemba Synd.)	5	510	436·27	1.809
Do. (sands)	-	240	94·04	390
Lemberg (A. D. Bentley)	2	250	56·91	236
Malti (Brunton & Talbot)	--		3·18	13
Midwinter	4	426	67·38	279
Do. (sands)		260	25·75	107
Moliere (H. Moser)	5	758	90·72	376
Mudale (B. C. Munro)	2	172	136·21	565
Cam and Motor G.M. Co., Ltd.	—	11.997	3.823·11	16.21[illegible]
Norman (Fraser & McBean)		200	36·21	150
Oleander (O. T. de Villiers)	3	408	102·70	426
Orcus 17 (St. Kilda Syndicate)	3	5	10·69	44
Owl (A. Rolfe)	10	1,527	433·51	1,797
Do. (sands)	—	1.300	265·11	1,099
Pickstone Gold Mines, Ltd.	10 1C	2.900	337·24	1.398
Do. (sands)	-	1 451	349·49	1,449
Pomposo (J. Knott)	5	90	43·00	178
Reward (Mrs. Smith)	5	70	11·99	50
Rosaline (J. F. Meade)	5	369	43·57	181
Rouge (Brunton & Talbot)			6·11	25
Rover (Brunton & Talbot)	—	—	3·99	17
St. George 1 (Hussey & Fraser)	—	—	18·76	78
St. John del Rey (V. L. Synd.), sands	-	610	21·66	90
Seigneury (Arnold & Windley)	5	414	178·63	740
Do. (sands)	—	300	19·25	81
Shepherds (Phoenician (Rhod.) Co., Ltd.)	5 1T	1,030	282·57	1,171
Do. (sands)	—	1,030	113·22	469
Village Main (Bruce & Buchanan)	5	169	43·61	181
Do. I. Do.	—	160	37·98	158
Warthog (Brunton & Talbot)	..	—	8·15	34
Washington (I. J. Minnaar)	5	512	214·60	890
Do. (sands)	—	400	42·33	175
Hartley district total			14,703·27	61,395

LOMAGUNDI DISTRICT.—

	No. of Stamps.	Tons Treated.	Yield. ozs.	Value. £
Alluvial (A. Smith)	—	—	10·78	45
Do. Do. (August)	—	—	5·97	25
Do. (G. Blacklaws)	—	—	26·73	111
Do. (A. G. Deane)	—	—	14·00	58
Do. (W. Kelly)	—	—	13·01	54
Eldorado Banket G.M. Co., Ltd.	15 1C 4P	5 243	1,765·54	7,415
Do. (sands)	—	5,195	809·68	3,401
Gondia (J. A. Morris)	5	290	33·63	139
May (May Syndicate.), Ltd.	5	400	129·98	539
Do. (sands)	—	500	85·00	352
Mediteraneo (Perhat & Baburizza)	2	75	22·41	93
New Bonanza (New Bonanza Syd.)	1D	25	10·41	43
Lomagundi district total			2,927·15	12,275

MAZOE DISTRICT.—

	No. of Stamps.	Tons Treated.	Yield. ozs.	Value. £
Botha H. (Cunningham & Allison)	5	2,068	84·08	349
Do. (sands)	—	930	130·78	542
Day Dawn (Day Dawn Tribute)	2	347	190·18	788
Epha (H. M. Epton)	2	200	50·12	208
Jumbo G.M. Co., Ltd.	30	2,640	414·09	1,760
Do. (sands)	—	1,740	185·12	787
Do. (slimes)	—	900	117·92	501
Kimberley (Mash.) G.M. Co., Ltd.	8 2T	5.200	1,077·70	4,569
Do. (sands)	—	2,200	448·98	1,879
Do. (slimes)	—	3,000	309·57	1,296
Lowland Chief (Brice, Skitt and Pickles)	—	—	2·80	12
Mitre (Bishop's Syndicate)	1D	11	28·38	118
Do. (sands)	—	20	10·28	43
Micky (Micky Syndicate)	2	458	345·08	1,431
Plum (Harries & Cook)	2	180	25·22	105
Do. (sands)	—	180	45·15	187
Puff Adder (Puff Adder Syndicate)	2	106	38·22	158
Do. (sands)	—	504	41·54	172
Ravine (H. O. Coker)	2	227	76·00	315
Tat (Oceola G.M. Co., Ltd.)	5	496	267·59	1,109
Do. (sands)	—	308	22·80	94
Venus (Giles & Southey)	2	266	154·34	640
Xmas (P. Pearce)	2	130	22·46	93
Mazoe district total			4,088·40	17.155

SALISBURY DISTRICT.—

	No. of Stamps.	Tons Treated.	Yield. ozs.	Value. £
Alpes (P. Zaffere)	5	101	130·42	541
Arab	1D	76	47·41	197
Arcturus (L. Chiappini), sands	—	750	100·53	417
Ceylon (Monarch (Tati) G.M. Syd.)	5	954	436·49	1,809
Do. (sands)	—	954	261·48	1,084
Crown (Diggers' Syndicate)	2	91	37·60	156
Found A. (O. W. Kelly)	2	142	94·84	393
Inyague (P. L. Peters)	2	185	55·36	229
Joker (Harrison & Drabble)	2	309	92·55	384
Louise Grand (H. S. Plant)	1H	1.160	74·01	307
Do. (sands)	—	1,031	76·66	317
Mont d'Or (Claxton & Bussell)	2	90	113·36	470
New Full Back (July)	2	70	18·81	78
New Full Back (August)	2	96	22·12	91
New Brixton (J. H. Hall)	2	85	19·74	82
Old Loyalty (Shamva Ilex G.M. Co., Ltd.)	5	502	152·76	633
Do. (sands)	–	535	83·88	348
Olympus (D. Peridis)	1H	200	54·94	228
Radnor (London & Rhodesia Mining & Land Co.)	5 2P	1.080	486·26	2.016
Shamva Mines, Ltd.	56·8T	47,718	2,642·67	11,099
Do. (sands)		19,391	1,920·02	8.064
Do. (slimes)		28.886	2.859·71	12.011
Salisbury district total			9,781·62	40,954

UMTALI DISTRICT.—

	No. of Stamps.	Tons Treated.	Yield. ozs.	Value. £
Arthur (Mrs. H. L. Hoole)	1H	70	12·86	53
Cirundhu (E. K. Evans), sands		180	12·66	52
Champion (J. Buchanan)	5	890	84 46	350
Do. (sands)		500	141·03	585
Do. (slimes)		390		
Elgin (Umtali Waterfall Synd.)			27·73	115
Fairview 3 W. (Branken & Markham)	5	100	54·32	225

	No. of Stamps.	Tons Treated.	Yield. ozs.	Value. £
King's Daughter D.B. (Umtali				
Inca (Fred Young)	8	225	42·16	175
Kent (Kent Mines, Ltd.)	10	518	180·34	748
Do. (sands		600	47·86	198
Waterfall Syndicate)	—		25·99	108
Lisboa I. W. (G. T. Hopkins)	5	120	7·62	32
Liverpool (R. G. Snodgrass)	5	575	80·10	335
Do. (sands)	—	200	27·37	113
Monte Carlo 3E. (H. Pollack) ...	1H	550	38·60	160
Montezuma No. 2	5	670	166·41	690
Do. (sands)	-	25	30·94	128
Perthshire D.B. (Kent Mines, Ltd.)	(10)	192	102·20	449
Pilgrim 2 E. (O Cawood)	10	810	141·05	585
Quagga Thompson, Murdock and Kapnek) .	5	355	72·18	299
Do. (sands)	—	550	16·39	68
Rezende Mines, Ltd. ...	115	17,600	1,467·93	6,229
Do. (sands)	—	3,322	312·55	1,330
Do. (slimes)		1,094	124·23	527
Do. (concentrates)	- -	173	614·43	2,580
South Perthshire (Umtali Waterfall Syndicate) ..	(10)	78	21·96	91
Do (sands and slimes)	-	47	9·17	38
Surrey (Keir & Rooke), July	5	780	221·88	920
Do. (sands)	-	600	65·89	273
Do (August)	5	775	294·84	1.222
Do. (sands)		600	124·26	515
Two Sisters (F. S. Simmonds)	2	42	6·77	28
Umtali (Umtali Waterfall Synd.)			40·13	166
Umtali district total			4.624·11	19,387
VICTORIA DISTRICT—				
Empress A. (S.A. Prospecting and Concession Syndicate, Ltd.) ...	5	905	263·03	1,090
Do. (sands and slimes)		540	126·62	525
Texas (G. Scott)	10	1.433	325·42	1,439
Do. (sands)		775	151·24	627
Victoria district total			866·30	3.591

Mashonaland total .... 36.990·85 ozs.
Value £154,756
Total gold production .... 75,998·96 ozs.
Value £316.972

OTHER MINERALS.

		Value.
Silver, ozs.	11,785·65	£1,103
Lead, tons	11·30	132
Copper, tons ..	86·50	4,325
Chrome iron, tons	6,433·28	14,360
Coal, tons ..	24,142·00	10.483
Diamonds, carats	25·25	234
Grand total value of production.		£347,659

GOLD OUTPUT COMPARISONS.

	Ozs.	Value.
July, 1914	76,687·48	£320.670
August, 1914	75,998·95	316,972
Decrease ..	688·53	£3.698
August, 1914	75,998·95	£316,972
August, 1914	59,555·42	250,276
Increase ..	16.443·53	£66.696

C: Chilian mill. T: Tube mill. G.R.: Gates' roll. H: Huntington mill. P: Grinding pan. Pn: Pneumatic mill. D: Dolly.

Lydenburg Lands Annual Meeting.

The annual meeting of the shareholders of the Lydenburg Land and Exploration Company, Ltd., was held at Stock Exchange Buildings this week, under the chairmanship of Mr. E. Brayshaw. In moving the adoption of the report, the Chairman said that during the past year the board, after consultation with the principal shareholders, decided to adopt an active policy of selling farm surface rights at favourable opportunities; and in pursuance of this plan disposed of two farms (11,312 acres). The cash instalments received in respect of the sales permitted repayment of a loan and gave the company cash in hand. The balance of the purchase price in each case was secured by first mortgage bond over the farm. A valuable mineral water occurs on a farm adjoining Welgegund, and, in arranging the sale of this farm, the fullest safeguards were provided to ensure the company receiving the sole benefit of any similar occurrence. The directors again waived their fees for the year. The financial depression prohibited dealing with the farm Schoongelegen, but the prospecting work done in earlier years held out promise of its mineral deposits proving valuable assets when normal conditions again obtain. The company has £4,800 earning interest, and owns the freehold of 124,771 acres, and in addition the mineral rights under further 13,317 acres, all situate in the Transvaal. In the future the demand for land for cattle ranching and agriculture generally should increase, and the company should ultimately get good prices for our surface rights. The report was adopted, and the retiring directors, Messrs. William Mark Bielski and Ernest Mansfield, were re-elected.

Afrikander Proprietary.

The London Secretary of the Afrikander Proprietary Gold Mines, Ltd., announces that, in view of the existing state of European affairs, the directors have decided to extend the date on which applications for shares in the new issue are to close to a date which will be fixed and notified later. The guarantors have agreed to continue the guarantee in force until November 15 next.

The board of directors in London have declared an interim dividend of 6¼ per cent. Warrants will be posted to shareholders on October 16th, 1914.

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COMPANY, LIMITED
(INCORPORATED IN THE TRANSVAAL).
ESTABLISHED 1892.

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"PRETORIA" PORTLAND CEMENT, QUALITY UNSURPASSED.

Every bag guaranteed to pass the full requirements of the British Standard Specification.

REMEMBER: Our guarantee is backed by over 20 years' experience of South African conditions

PROCURABLE FROM ALL MERCHANTS IN SOUTH AFRICA.

SEARCHING FOR GOLD A QUARTER OF A CENTURY AGO.

Prospecting Reminiscences of German South-West Africa and Portuguese East Africa.

[By A. J. Arthur.]*

Now that the territories of Namaqualand and Damaraland, generally known nowadays as "German South-West Africa," are assuming importance from a strategic (if from no other) point of view, the following notes of prospecting trips in both West and East Africa may be of some interest to the public, especially as they give graphic descriptions of the two classes of country, the one all swamp, and the other all sand. All pioneer Randites will remember that after the great mining " boom " of 1889, Johannesburg and the Rand generally suffered a great " slump," and as Mashonaland, Matabeleland, and all the territories " up north," now known by the generic term Rhodesia, were then practically terra incognita, and consequently, in a prospector's eye, must be easily superior to anything yet known. It was ever thus: distance lends enchantment to the view, and in an evil moment I determined to exploit some of these new fields, and in a still more evil moment decided, after careful study of the map, to pioneer a new route. By wagon from Johannesburg to Bulawayo, the then seat of the Matabele king, Lobengulu, meant many hundreds of miles of weary wagon trekking, so I formed one of a party of thirteen (absit omen) who were the first to attempt to create a short cut from Durban via the Pungwe River. This short-cut meant, we knew, a long sea voyage, but, according to the map, only a short land journey. Of course, there was no railway in that Portuguese territory in those days, but the map beguiled us. Also, there was no regular steamer service to the then practically unknown port of Beira, but we heard that there was a chance of picking up a coaster which would land us there. So the thirteen of us travelled by ox-wagon from Johannesburg to Newcastle, and thence by train to Durban, where by good or ill luck we found a small paddle steamer called the " Buffalo," bound for Pungwe, and we embarked. All went well until we were about a hundred miles north of Delagoa Bay, at which port we were not even supposed to call, and then the wretched little steamer of eighty tons began to leak. We had to put back, and after the most arduous labour by all hands, we got into Delagoa Bay in a sinking condition. The pumps were useless, there was only one boat, and crew, firemen, passengers, all had to work day and night hauling water, with hand winches, in old oil drums, for seventy hours to save the miserable " Buffalo " from going down under us!

Beira in the 90's.

Arrived at Beira, then a mere village of bamboo huts built on a spit of sand away from the swamps which then surrounded it, we landed, and each of us had to pay £1 13s. 4d. for a passport to proceed to Bulawayo, and then we were calmly informed that owing to a recent fight between the Chartered Company's police and Portuguese troops, in which the latter had been expelled from Massikessi, we still would not be allowed to proceed inland. So there we had to camp in that then fever-stricken hole for six weeks, with the rainy season in full swing. Eleven of our party of thirteen died of fever in that short time, and when at last the s.s. " Limpopo " happened, fortunately, to come into the Pungwe river, only a man named Roscoe and I, two gaunt skeletons, were left out of our lot for her to carry back to Durban, where I lay in hospital for nearly three months before I was again fit to move. Roscoe died there, so I was the only survivor of that ill-fated party. And thus ended my attempt to get to Matabeleland by a " short-cut."

German South-West Africa.

After a couple of years' trading in Eastern Pondoland, and some little time on the staff of the " Cape Argus " in Capetown, I was appointed by Messrs. Vom Dorp, Scharfscheer and Co., of that city, to proceed to German South West Africa to prospect for gold; and as that country is looming large in the public eye just now, it will perhaps be of interest to hear something of it. Of course, this expedition was under German auspices, and my only European companion was a German, and a very decent fellow, too; but the only foundation for any belief in the existence of gold there was a wonderful yarn of some wonderful reefs, brought to Capetown by men who had been digging guano in the country near Ichaboe, and other islands off the coast of Damaraland. This guano is the deposit of the millions of penguins, etc., which frequent these coasts, but the deposits on the islands are superior to those of the mainland, because the latter become too much impregnated with the driven sands of this desert country to be of any value as manure. The deposits on the mainland are often fifty and sixty feet in thickness, and it was in the course of investigating their value that these men had found the reefs I now had to open up. Our destination was Hottentot Bay, but the " Nautilus," the little steamer which carried my mate, myself, six natives, tools, dynamite, rations for eight months, and fifty hogsheads of water (for we were going to an absolutely waterless desert) found it impossible to land us on the voyage up coast, owing to a heavy south-easter, and had to carry us on to Walfisch Bay, a fine natural harbour, some three hundred miles north of our proper destination. However, a week later she managed to land us and our stores, especially our precious fifty hogsheads of water, and our first work was to build a very solid house of sandbags. Nothing less substantial could resist the frightful sandstorms—continually blowing from sunrise to sunset—of that howling wilderness, and even this solid building the finer "silt" used to penetrate to such an extent that our bedding and food were often a mass of sand.

No Gold.

I sank four shafts there on these reefs, to depths of from fifty to eighty feet, but not one colour of gold rewarded our efforts; and just as we had reached our last hogshead of water the "Nautilus" again arrived, and after eight months of this most inhospitable desert I was indeed glad to get away from that barren land and those barren reefs. In addition to Hottentot Bay and Walfisch Bay, I also visited Angra Pequena (now Luderitzbucht) and Port Nolloth. As I have said, Walfisch Bay, which is British territory for a radius of twenty miles inland, is a fine harbour, but neither Hottentot Bay nor Luderitzbucht are capable of admitting big ocean-going vessels, while inland the country is fit only for the nomadic Hereros, Damaras and Namaquas, who somehow manage to exist principally on a wonderful species of melon which grows even in the most barren spots.

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*By A. J. Arthur, prospector of the Lancaster, Champ d'Or and other West Rand mines; late manager of the King Arthur mine, West Australia; the Golden Crown mine, Zululand; and underground manager of the Van Rooyen mine, near Vrijheid, Nieuw Republiek.

Engineering Notes and News.

Mining Machinery Statistics.

The following table shows the number and weight of stamps erected and at work in connection with the gold mining industry at 31st December, 1913:—

		Weight of Stamps. 1501 to 1700 lbs.	1701 to 2,000 lbs.	Total.
Witwatersrand	Erected	1,770	1,649	10,511
	At work	1,425	1,295	9,165
Outside Districts—(T'vaal)...	Erected	12	55	1,219
	At work	10	55	594
Cape	Erected	—	—	10
	At work	—	—	—
Natal	Erected	—	—	20
	At work	—	—	5
Union of South Africa ...	Erected	1,782	1,704	11,760
	At work	1,435	1,350	9,764

Tube Mills: These plants (all in the Transvaal) have continued to increase in number.

Tube Mills (Gold Mines)	Number	Horse Power. Total.
Erected at 30th June, 1906	55	2,766
Erected at 30th June, 1907	69	4,720
Erected at 30th June, 1908	97	7,532
Erected at 30th June, 1909	159	12,527
Erected at 30th June, 1910	203	17,852
Erected at 31st December, 1911 ...	285	27,511
Erected at 31st December, 1912 ...	306	30,054
Erected at 31st December, 1913 ...	331	33,175

In addition there were erected five tube mills on diamond mines, and seven on base mineral mines in the Transvaal. The actual total number of rock-drill machines in commission on the Witwatersrand gold mines during December, 1913, was 9,193 of the following types:—Large reciprocating piston machines, 5,012; small reciprocating piston machines, 2,310; air-feed hammer machines, 1,604; hand hammer machines, 267.

Mechanical Coal Cutters: The following table shows the number of coal cutters in use in December, 1913, the class of power employed, and the percentage of mining work accomplished by machines over the year:—

Province.	Number of Machines. Electricity.	Compressed Air.	Total.
Transvaal	—	272	272
Cape	4	—	4
Orange Free State	—	20	20
Natal	21	141	162
Union of South Africa	25	433	458
1912	25	386	411

Boilers: The number of inspections and hydraulic tests of boilers carried out by the Inspectors of Machinery during the year were as follows:—

	Transvaal.	Cape. Capetown Division.	Kimberley Division.	Orange Free State.	Natal.
External inspections ...	3,315	265	486	332	903
Internal inspections ...	2,860	286	458	256	788
Hydraulic tests	1,559	179	287	199	228

Making a grand total for the Union of—External inspections, 5,301; internal inspections, 4,648; hydraulic tests, 2,452. Resulting from these inspections permission to use was granted in nearly every case, it being, however, temporarily withheld in several instances until necessary repairs or cleaning had been carried out. Each of the new boilers inspected was considered fit for the steam pressure asked for. The stationary boilers (numbering about 800) of the Department of Railways and Harbours, which are not exempted from independent inspection under the Mines and Works Act of 1911, are inspected and tested by District Boiler Inspectors, who are appointed under Section 3 of the Mines and Works Act of 1911 and whose reports are forwarded to the Mines Department. These inspections and tests are not included in the above figures, nor are the boilers themselves classified in the tables which follow. The number of boilers in which it was considered necessary to reduce the working pressure was twenty-five in the Transvaal, thirty-five in the Cape, seven in the Orange Free State, and nine in Natal.

Relative Advantages of Hammer and Reciprocating Drills.

A theme which is often considered by engineers is the relative advantages of hammer and reciprocating drills. The matter is usually discussed by writers of text-books on the application of compressed air to drilling, and competitive tests are often made between the two types of drills. Such a discussion is presented by P. B. McDonald in the June 15 number of the *Canadian Mining Journal*. The author gives an account of a test in a Lake Superior mine, from which he illustrates some of the advantages of the hammer principle. His general discussion follows:—

Drill steel can be changed more quickly with a hammer machine than with a reciprocating machine because the steel rests loosely in the chuck and does not require the careful tightening which a reciprocating drill chuck does. The time spent changing drills may seem only a small details; but it is noticed in the records that half as much time was consumed in doing that as in net drilling time, so that for two hours of actual drilling as much as one hour might be spent in changing steel. It is wise to economise on such an important detail. The mounted, screw-feed, hammer drill can be set-up, adjusted to the correct distance from the face of the rock, and the holes pointed advantageously, with greater facility than a reciprocating drill, because the stroke of the machine is taken care of in the cylinder and does not affect the drill steel or chuck. It helps to save time in several of these auxiliary operations. In starting a new hole with a reciprocating drill, especially a "cutting-in" hole at a glancing angle to the face of the rock, the air can only be turned on half-force for a few minutes or the blows would slide off the rock. As a hammer drill uses many light blows in place of a smaller number of heavy blows, the holes can be started with more precision, and inequalities on the surface of the rock are not so likely to deviate the drill. There can be little doubt that a hammer type drill is theoretically a more efficient and scientific machine for cutting a hole than is a reciprocating type. In the latter type power is consumed in overcoming friction and inertia of the drill-steel. This in a six-foot length of hole may be a considerable item, due to the drill steel rubbing against the sides of the hole as it is reciprocated and turned. In the hammer type the only weight moved is the hammer alone, which imparts all its energy through the drill-steel to cut the rock. More practical, if smaller, considerations are that the miner's helper is not liable to have his knuckles barked by a reciprocating and rotating chuck, and the miner can feed the machine ahead until the chuck fairly touches the rock, whereas with a reciprocating drill he would probably stop it an inch from the limit of the feed, due to not being able to distinguish the whereabouts of the swiftly moving chuck. There are small points, but it is on record that miners have refused to use a certain make of machine because the crank-handle was not rounded, but was so sharp ended as to hurt the hand of the man who turned it. The hammer types have some disadvantages. In the earlier makes difficulty was experienced in keeping the cutting of the drill-steel close against the rock, so that the full force of the blows was sometimes lost. The latter types, more carefully made, have improvements which obviates this. In a hammer drill, the drill-steel may be struck over a thousand blows per minute. From 10 to 15 per cent. of these blows may be struck when the bit does not touch the bottom of the hole, because a piece of hard steel cannot be hammered and pressed against rock without bouncing back. The troubles of broken drill-steel are due partially to this, but are not serious with good steel. Also there are some varieties of rock, clayey or sticky, which drill better with a drill steel churning and plunging in the muddy chippings, which refuse to wash away, than with the hammer drill. As to the stoppages of the "stoper" hammer drills or of the hand sinkers, such as the Jackhammer, little need be said. It is pretty well accepted that the one-man stoper drill has revolutionised over-hand stoping and raising all over the world. In many mining districts, as on the Marquette Range, Michigan, an enormous number of stopers are in use. In a few districts, such as the Birmingham iron mines, Alabama, they were tried and not liked. The little hand sinkers have risen suddenly to fame for down-holes, especially since automatic rotation types came out. For shaft-sinking they are time savers, as much for the facility with which they can be taken out of the way at blasting time as on account of the much greater number of machines which can be operated in the confined space.

"Small Mines" Activity.

The returns made to the Mines Department show the following comparative figures from gold mining concerns outside the Witwatersrand on which less than ten stamps were run:—

	1912.	1913.
Tons crushed during the year	101,341	77,135
Value of gold won during the year	£118,914	£87,276
	Dec., 1912.	Dec., 1913
Number of producers	30	26
Stamps dropping	116	99
Whites employed by above producers	104	82
Coloured employed by above producers	1,249	943

Taking all the concerns outside the Witwatersrand area which may be considered as run by small syndicates or private people, excluding comparatively large companies such as the Nigel, Sub Nigel, Glynn's Lydenburg, Sheba, Transvaal G.M. Estates, etc., the following comparisons are arrived at for the two years:—

	1912	1913
Tons crushed during the year	254,000	231,240
Value of gold won during the year ...	£274,775	£214,230
	Dec., 1912.	Dec., 1913.
Number of producers	44	36
Stamps dropping	281	224
Whites employed by above producers	232	166
Coloured employed by above producers	2,982	2,003

Foreign Patentees After the War.

The British Act and Rules made under the new Foreign Patents Act are only to continue in force during the continuance of the present state of war in Europe and for a period of six months thereafter. This provision raises an interesting question. Are patents, designs and trade marks to be avoided or suspended for not longer than six months after the termination of the war, and then to be automatically restired, or is the avoidance or suspension to be irrevocable? Evidently the latter is not to be the case, for the Board of Trade have powers to revoke any avoidance or suspension at any time in their absolute discretion. The matter appears to us to be in a state of confusion, and the Government have evidently found it to be so, for the President of the Board of Trade introduced a Bill recently into the House of Commons to amend the Patents Act they passed only a few weeks ago. The President, in his introductory remarks, explained that the new Act was not as clear as it might have been. The new Bill is not available at the moment of writing, but if it merely proposes to take further powers to deal with patents, designs and trade-marks for the term of the war it will be of little value. It would not be worth anyone's while to go to the expense of laying down machinery and plant for the establishment of a new manufacture if he is to be liable to be stopped six months after the expiration of the war, or if he may then be called on by the foreign patentees to pay an unknown royalty in order to continue the manufacture or the process he had established. Of course, much will naturally depend upon the terms to be obtained at the end of the war. If we conquer "all along the line," our Government may make any terms it likes. The Act and Rules have been drafted to meet circumstances that might arise; they have not been drafted, as we have heard and seen it assumed, as an engine of destruction against the industrial property of our enemies. We may be sure that the Board of Trade will act fairly and honourably, and will vigorously discourage applications by persons who are not in a position to prove the requirements mentioned above. It is to be hoped that our enemies will deal fairly and honourably in regard to British patent property in their States.—*Engineering.*

Work of Mines Department Laboratory.

The majority of the tests carried out at the Mines Department Laboratory (says the annual report of the G.M.E.) last year were the bi-yearly tests of wire ropes used for the raising and lowering of persons, as required by the Mines, Works, and Machinery Regulations. A noteworthy feature in connection with these tests is the small variation between the actual breaking loads of the ropes as tested at the mechanical laboratory and as declared by the makers and suppliers of the ropes. This is most probably due to the fact that, in a number of cases, new ropes are tested in the country of manufacture before being sent out to this country. The depreciation in the breaking load of wire ropes used in compound and incline shafts, due to wear and arrested vibration at the capel ends of the ropes, was exemplified under test in a number of cases. The following is an instance:—Rope of 8/6/1 construction; Lang's lay; plough steel 128-134 tons steel (stress per square inch); breaking load (when put into use) 59·024 tons. After six months' wear the breaking load—under test—was 35·85 tons, a reduction of 39·3 per cent.; seven days later a length of, approximately, 50 feet was cut off the end of the rope and tested, the result being 41·62 tons, a reduction of 29·5 per cent.; fourteen days later a further length of approximately 100 feet was cut off and the test result was then 50·21 tons, or a reduction of 15 per cent. from the original breaking load of the rope. A feature to be noted in connection with the class of steel used in the manufacture of wire ropes is that a lower breaking stress per square inch is now employed, the average being approximately 120 tons (of 2,000 lbs.) per square inch. Fatigue tests: A number of tests were made in the "Vaughan-Epton" fatigue testing machine. In one case a wire rope used for the raising and lowering of persons was found to develop broken wires to an alarming extent each day. When the individual wires composing this rope were tested in the fatigue testing machine, it was found that only 50 per cent. of these wires were able to withstand the continual bending and tensile stresses to which the rope was subjected when in use without undue stretching, which accounted for the breaking of the individual wires. The ordinary methods of test (tension, bending, and torsion) showed no appreciable difference in the wires composing the rope. In another case, ropes of different makers working in contiguous compartments of a shaft varied considerably in their length of life, the daily work performed by each rope being practically the same. It was proved from fatigue tests of the wires from an unworn sample of each of these ropes that the difference in quality could have been initially established in the laboratory. Cement tests: As in previous years, the majority of the tests made under this heading were of cement manufactured by the Pretoria Portland Cement Company. The chief feature was the consistency of this locally manufactured cement, which equals and often excels imported cements. Building stone tests: Special types of concrete used for building purposes and flooring were tested. In some of these tests the folly of using too small a proportion of cement was demonstrated. Miscellaneous tests: A link chain made of iron and used as a connection between trucks on an underground haulage was tested. The fracture showed the crystalline nature of the iron developed during use. Tests were also made for the South African Railways, to obtain the overturning moment of a rail, with different types of connections of the rail to the sleeper.

The following resolution was passed at a meeting of the Association of Certificated (S.A.) Mechanical Engineers, held last Saturday. "The Council and members respectfully beg leave to tender their humble thanks and congratulations to General the Right Hon. Louis Botha and General the Hon. J. C. Smuts, K.C., for the great work which they have undertaken in South Africa: (1) For assisting in the preservation and consolidation of the British Empire; and (2) for the preservation of British and Colonial commercial and national credit; and (3) the defence of the freedom of its citizens. The Association also recognises that if the generous help of the Home Government had not been extended to South Africa during the present crisis, and if the South African Government had not wisely given its support and assistance, the whole of the public and Civil Service and the whole commercial community in South Africa would have suffered the most serious damage."

Latest Metal Quotations.

Electrolytic copper is £54 15s. per ton; quicksilver, per bottle of 75lb., £7 5s.

WANTED:

Position as COLLIERY MANAGER or ASSISTANT to same in Union of South Africa or Rhodesia. Advertiser holds such a position at present; with First Class S.A. qualification and three years' Transvaal mining experience, also practical knowledge of Oil Shale prospective development.
Reply, "CARBON," c/o "S.A. Mining Journal," Box 963, Johannesburg.

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Finance, Commerce, and Industries.

Public Works Contracts.

In reply to an inquiry the Provincial Secretary notifies that the Administrator in Executive Committee has decided, in view of the urgent need that exists for effecting economies in every possible direction, to suspend till further notice all contracts which have not been signed by the successful tenderers and their sureties. The contracts which are at present in hand will be completed.

* * * *

What We Might Produce.

The return of articles imported into the Union in July, which are capable of being produced in the Union, includes wheaten flour to the value of £60,467, wheat £55,870, sugar and sugar products £48,643, milk £46,921, furniture £46,584, tea £29,267, butter £25,690, confectionery £24,690, hams and bacons £22,655 cheese £16,580, preserved meats £12,332, unmanufactured leather £15,802. The total value was £520,338.

* * * *

Ocean Freights.

Representations have been made by the Minister of Finance through the High Commissioner in London urging a reduction of the surcharges announced by the shipping lines as from 10th August, viz.: 33⅓ per cent. on outward freights, 25 per cent. on homeward freights and 33⅓ per cent on coastwise rates. The surcharge on outward freights was reduced to 25 per cent. from 22nd August and to 20 per cent. as from 7th September; and on coastwise freights to 25 per cent. from 14th September. On the 9th instant the surcharge on freight from New York was also reduced to 20 per cent.

* * * *

Freights from England.

The Union Treasury announces the receipt of advices from the High Commissioner for the Union of South Africa in London, to the effect that Union Government has been successful in getting the Union-Castle S.S. Co., Ltd., to withdraw the surcharge imposed upon freights to and from South Africa, in so far as concerns shipments under the three agreements existing between the shipping company and the Government. These three agreements are:—(1) The Ocean Mail Contract, the commodity principally affected being fruit for export. (2) The Government Freight Contract, which applies to outward freight shipped on behalf of the Government. (3) The Homeward Produce Contract, which applies to maize, cereals, wattle-bark, wool and skins. The company has also agreed to refund any amounts paid in respect of surcharge agreements under Clause 1 and 3. Negotiations are still proceeding with a view to the reduction of surcharges on merchants' freights.

* * * *

Trade with the Enemy.

The presence of a large number of naturalized Germans trading in our midst (says *The Times*) has raised various questions of difficulty and complexity to traders with whom they have been accustomed to deal. An expert committee of the London Chamber of Commerce has had under consideration a number of technical questions in regard to contracts in war time, liability for war risks, contraband of war, payments to foreigners, and various difficulties in connection with import and export trade, and a special circular has been issued by the Chamber giving some very helpful information to members on all these questions. The committee is meeting regularly to deal with questions as they arise, and have, provisionally and under reserve, given answers to questions which have been submitted to them. The answers are not to be regarded as legal opinions—although it is understood legal opinion has been engaged—and are subject, of course, to the obligation of members to consult their own legal adviser where necessary.

* * * *

The Position of Government Contractors.

The Union Government have given instructions regarding the position of Government contractors, to the Union Tender Board, through the Secretary of Finance, as follows:—"I am desired by the Minister of Finance to state for the information of your Board that, while it is not the intention of the Government in the present crisis to force contractors to carry out obligations which would involve them in financial loss, it is necessary to guard against any inflation of prices which is not justified by the shortage in the supply of goods, but is the result of an attempt to take advantage of unsettled conditions. The Minister considers, therefore, that generally, contractors should continue to be informed that they will be held responsible for the performance of contracts formally entered into. Where, however, contractors represent their inability to supply goods, your Board, in consultation with the department concerned, should make such arrangements as are deemed best in the circumstances, after receiving satisfactory evidence that conditions justify a variation of the contract."

Trading with Germans.

As some confusion still prevails in regard to trading with the enemy, we publish the following extract from the letter of the Secretary of Finance to the Johannesburg Chamber of Commerce:—Generally, the policy of the Union Government in regard to trading with the enemy will be in harmony with that pursued in the United Kingdom. As arranged with the deputation from your Chamber, the Minister of Finance caused inquiries to be made as to the attitude of His Majesty's Government in relation to the aspects of this question put forward by the deputation. As a result of these inquiries, it appears that, in adopting the policy indicated in the new Proclamation the Imperial authorities have been actuated, not by motives of toleration or solicitude for German or Austrian subjects carrying on business in British territory, but solely by the widest considerations of self-interest. The German and Austrian subjects employ British labour, they occupy property belonging to British subjects, and in other directions the carrying on of their businesses contributes to the welfare of the community; and it is recognised that, while benefit to individual British subjects may flow from a policy of restricting trading by German or Austrian subjects, the aggregate of these benefits is insignificant in comparison with the loss inflicted by such a policy on the community at large.

Germany's Loss of Trade.

A recent issue of the *Gazette de Hollande* prints a summary of an article "published a few days ago by a Berlin journal" on what Germany stands to lose by a British blockade of the North Sea. In the article in question, observes the *Gazette de Hollande*, the writer explains that as German commerce of the value of many millions, the falling off of which must inflict the most serious economic injury, is threatened, everything depends on whether England will be in a position to keep up her mastery of the sea. A few pregnant figures will explain, he says, what terrible significance the crippling of Germany's oversea trade would have for her industry and agriculture. If the British blockade took place imports into Germany of roughly six thousand million marks (£300,000,000) and exports of about eight thousand million marks (£400,000,000) would be interrupted—together an oversea trade of 14 milliards of marks (£700,000,000). This is assuming that Germany's trade relations with Austria-Hungary, Switzerland, Italy, Belgium, Holland, Denmark, Norway and Sweden remained entirely uninfluenced by the war—an assumption the optimism of which is self-evident. A glance at the figures of the imports shows the seriousness of the situation. What is the position, for example, of the German textile industry if it must forgo the imports of oversea cotton, jute and wool? If it must forgo the 462 millions (£23,100,000) of cotton from the United States, the 73 millions (£3,650,000) of cotton from Egypt, the 58 millions (£2.900,000) of cotton from British India, the 100 millions (£5,000,000) of jute from the same countries, and, further, the 121 millions (£6,050,000) of merino wool from Australia, and the 23 millions (£1,150,000) of the same material from the Argentine? What could she do in the event of a war of longer duration without these raw materials which in one year amount in value to 830 millions (£41.500,000)? It may also be mentioned that Germany received in 1913 alone from the United States about 300 millions (£15.000,000) of copper, and, further, that the petroleum import would be as good as completely shut down. The German leather industry is largely dependent on imports of hides from oversea. The Argentine alone sent 71 millions (£3,550,000) worth of hides. Agriculture would be sensibly injured by the interruption of the exports not less than 131 millions (£6,550,000). The significance of an effective of Chilean saltpetre from Chile, which in 1913 were of the value of blockade of German foodstuffs is to be seen in the following few figures: The value in marks of wheat from the United States is 165 millions (£8,250,000); from Russia, 81 millions (£4,050,000); from Canada, 51 millions (£2,550,000); from the Argentine, 75 millions (£3,750,000)—372 millions £18,600,000) from these four countries. There will also be a discontinuance of the importation from Russia of the following foodstuffs: Eggs worth 80 millions (£4,000,000), milk and butter 63 millions (£3,150,000), hay 32 millions (£1.600.000). Lard from the United States worth 112 millions (£5,600,000), rice from British India worth 46 millione (£2,300,000), and coffee from Brazil worth 151 millions (£7,550,000) should be added to the foregoing. No one who contemplates this condition of affairs without prejudice, says the writer, would be able lightly to estimate the economic consequences of a war of long duration.

German East African Railways.

Some interesting information relating to railway expansion in German East Africa is contained in the "Board of Trade Journal." The report is sent by the British Consul at Dar es-Salaam, and was written before the outbreak of the war. It states that there are two railway lines in the German East African Protectorate—the Usambara line and the Central or Tanganyika Railway. The Usambara Railway is 220 miles long and runs from Tanga to New Moschi, at the foot of Mount Kilimandjaro. The line was commenced in 1893, and the first section (to Mombo, 80 miles from Tanga) was opened to traffic in 1905. The remaining portion of the line was opened in February, 1912. The railway is leased to the Deutsche Koloniale Eisenbahnbauund Betriebs-Gesellschaft (Lenz & Co.), which constructed the Korogwe-Mombo section. The line runs through the picturesque district of the Usambara Valley and the Pare Mountains, and numerous plantations have sprung up along its length. Its effect on the trade of Tanga is shown by the following figures: Exports from Tanga in 1898, £21,400; in 1907, £133,000; in 1912, £666,341. The Central Railway, which runs from Dar-es Salaam to Lake Tanganyika, a distance of 780 miles, was begun in 1905. The first section was finished as far as Morogoro (130 miles) early in 1908, and in the same year the extension as far as Tabora (440 miles from Morogoro) was sanctioned. This work was carried on with such energy that Tabora was reached in February, 1912, more than two years before the date fixed in the original project. The continuation of the line to Tanganyika was sanctioned in 1911; the River Mlagrassi, the chief difficulty, was bridged in the spring of 1913, and the railhead reached the lake at Kigoma, near Ujiji, on 2nd February, 1914. This central line, which will become the main artery of traffic, with branch lines to the north-west and possibly to the south-west (Lake Nyassa region), is exepcted to play a most important part in the development of the trade of the Protectorate and in opening up the Tanganyika district. Lake Tanganyika appears to be regarded as the key to the trade of Central Africa, and the Germans have pushed on their railway with such remarkable energy that they are the first on the spot. It is now possible to travel from Dar-es-Salaam to Kigoma, on Lake Tanganyika, in two days and two nights, a journey which it used to take the caravans 60 days to accomplish. When the short stretch of line (about 170 miles) between Lukuga on Tanganyika and Kabola on the Congo is completed, it will be possible to travel across Africa, from Dar-es-Salaam to Boma, in about three weeks by rail and steamer, if direct connection at each stage is assumed. The return journey will occupy more than a month, as the steamers take twice as long to go up the Congo as to go down stream. Communications between Europe and Rhodesia will also be greatly facilitated as, allowing 12 hours for the steamer journey between Kigoma and the south end of Tanganyika, and again assuming direct connection at Dar-es-Salaam and Kigoma, it will be possible to reach Abercorn from London in about 24 days. It is anticipated that the German Central Railway will deal with much of the traffic to and from the eastern portion of the Congo and Northern Rhodesia.

Germany's Food Resources.

The Paris *Temps* prints an interesting contribution on Germany's economic power of resistance, from the pen of M. E. Daubigny, which is reproduced by the *Gazette de Hollande*. While the opinions there expressed will naturally be found to lean to the side of the writer's own nation, it is worth noting that even M. Daubigny does not share the general view that Germany will be quickly starved out. Her economic ruin is certain, he argues. Her industrial development and her financial resources are so closely dependent on the international market that she cannot hold on when it is closed against her. But economic ruin does not necessarily imply prompt starvation. Germany's resources in live stock are, he points out, equivalent to about six million tons of meat. As her population of 65 millions consumes two and a-half million tons per annum her supply in this respect is more than sufficient. Further, Germany possesses more than 350 cold storage factories and ten State owned military factories which should normally assure the revictualling of the armies. Each slaughter house has a cold storage works, and in peace time the troops have been accustomed to eat frozen meat. More than seven million tons of oats are produced annually in Germany, enough to feed four million horses. German military writers say that there is a sufficient supply of forage for one year. It is in the production of wheat that a deficit is inevitable, he declares. The annual production is 3,900.000 tons and the consumption 6,110,000 tons, showing a shortage of 2,210,000 tons. Moreover, the campaign began before the harvest and altohugh women, children and old men, together with forty to fifty thousand Russian reservists (who were prevented from returning home by the German military authorities) have been set to gather in the crops, he thinks it is not certain that they will do so in time. The combined action of the Anglo-French Navy will not prevent the continuation of the struggle if the soldiers and the population, although stinted, possess the indispensable resources, continues M. Daubigny. Germany encircled and blockaded will be like a besieged fortress. The authorities will ensure the daily allowance and distribution, and in a country militarised and disciplined like Germany there will be no great difficulty. Germany, therefore, he says, is at the present moment in possession of resources more important than would appear on a cursory examination. She had before the war made considerable provision in the matter of petrol and alcoholic essence. It is the failure of the latter commodity which might involve the starvation of the army. As for the credit of German banks, he declares that it was strangled by the withdrawal of French securities at the time of the French national loan and by advances to industrial houses which are powerless to repay, for they themselves are accustomed to give long credit to foreign firms. But the banks are able to dispose of more than £60,000,000, having been authorised to suspend all payment of English bills. With the £200,000,000 voted by the Reichstag and the £80,000,000 remaining over from the war chest, a total is reached of £340,000,000 as Germany's present resources. "Thus," concludes M. Daubigny, "the population of Germany, stinted reduced to a state of dearth, cannot be condemned to famine without a protracted campaign. It will lack money. Its army may suffer through defective transport, but too much hope must not be placed on these lateral circumstances."

£8,000 from J. B. and Robinson Group.

The secretary to the Prime Minister states that the Robinson group of mines has placed £3,000, and Sir J. B. Robinson personally £5,000, at the disposal of the Prime Minister to be used for any purpose in connection with the equipment of the expeditionary forces.

German Trade Outside Europe.

Under the heading of "Trade Aspects of the War with Germany," the Chamberlain Tariff Commission recently issued a memorandum sketching the general grounds of the position, and dealing particularly with German trade outside Europe. At the outset a general statement is made as to the situation, and in this it is remarked: "It must be remembered that for many years Germany has vigorously pursued a trade policy largely directed to ousting British goods, and that policy has been steadily and successfully pursued in the teeth of British competition. In order to win back markets we have lost, and to obtain and retain after the war markets in which Germany has established her position, we must organise all our trade forces, including finance, and get to close grips with the details of the various markets concerned." In some introductory remarks on details given relating to the home market, it is stated that the war with Germany has suddenly cut off the market for 40 million pounds worth of British exports, of which three-quarters, or about 30 million pounds, consisted of manufactures. At the same time there is a cessation of the importation into the United Kingdom of 66 million pounds worth of German goods, of which nearly three-fourths, or about 49 millions sterling, consisted of German manufactures. "Thus," it is remarked, "if British manufacturers now find it possible to adapt and reorganise their works to supply the displaced German goods in the British markets they may keep their workpeople employed. There is, moreover, the export trade of Germany to the Overseas Dominions and foreign countries outside Europe, amounting in all to about 109 millions sterling, of which three-quarters, or over 80 millions, are manufactures. A large part of this trade has been directly competitive, and there is very little of this German trade which by reorganisation cannot be supplied from the available British manufacturing resources." Commenting on German trade with the British Empire outside the United Kingdom, it is pointed out that "in seeking to capture this German trade with the British Dominions and other parts of the Empire, British manufacturers and merchants have the great advantage over all foreign competitors of substantial tariff preferences and emphatic sentimental preference in favour of British over foreign goods." Another section deals with German trade with foreign countries outside Europe, which is said to be the most important German export group apart from Continental markets. In this connection, it is pointed out that whereas the German exports to the British Empire, including the United Kingdom, have been of the value of £74,250,000, those of foreign countries outside Europe have been £91,750,000. "It is, of course," says the memorandum, "in relation to this group that British manufacturers must expect the keenest new competition from the United States, Japan and other industrial countries, as well as from the home production in each of the markets."

Civilian Training Association.

Seldom has a letter written to the Press had a more satisfactory and rapid result than that written under the initials "S.C.R." some three weeks ago, in which the suggestion was made that means should be provided to enable all those who so desired it to obtain military training in their spare time. As a result of this letter so much interest was aroused that in a further letter the writer asked those who were interested to meet him in the Board Room of the Consolidated Building, on the 10th ult. About 200 gentlemen availed themselves of the invitation, and the writer of the letter made himself known as Mr. S. C. Rees. An influential Committee was then and there appointed to work up the scheme, and having obtained the approval of the Government, at once set to work to bring to fruition the suggestions. At the present moment all those who have kindly offered their services as instructors are busy every afternoon and evening at the Drill Hall, together with Major the Hon. W. L. Bagot, D.S.O., who has undertaken the command of the movement. The first public drill to which all desirous of becoming proficient are invited, was held at the Wanderers "C" Ground at 2.30 p.m. on Saturday, 26th inst., and thereafter drills have been arranged for every evening. It is earnestly requested by the Association that all those who realise the enormous task our country has undertaken should endeavour to make themselves proficient, in order that if the time comes, as it easily might, all may be prepared to do what lies in their power. The movement is purely a voluntary one, and no obligation attaches to those enrolling. It is felt, however, that the manhood of Johannesburg will follow the example set by Britons all over the world at this critical time, and endeavour to become proficient. Employers of labour are requested to assist by calling the attention of their staffs to the opportunity now afforded.

As one of the results of the war, the Kansanshi and Bwana M'Kubwa Copper Mines have closed down, and the Broken Hill mine is now being worked with an attenuated staff, a number of the employees having already been given their congé.

Natal Coal Outputs.

The coal and labour returns of the Natal Province in August, 1914, are as follows:—Dundee Coal Co., 41,331 tons of 2,000 lbs.; Natal Navigation, 33,419; Hlobane, 28,384; Durban Navigation, 24,180; Natal Cambrian, 20,307; Utrecht, 17,304; Glencoe (Natal), 16,824; Hatting Spruit, 12,958; Elandslaagte, 12,344; South African, 11,655; Newcastle, 7,886; Ballengeich, 7,123; Natal Steam, 6,308; Ramsay, 6,129; Fairleigh, 3,709; Wallsend (Natal), 3,172; Dewar's Anthracite, 1,000; South African (Vryheid) Coke, 569; Avon Collieries, 256; Natal Ammonium, developing; total, 254,861 tons. corresponding month, 1913, 251,861 tons. Coal bunkered and exported at Durban: Bunker coal, 102,389 tons; coal exported—Oversea, 13,445 tons; to Union ports, 17,320 tons; total, 133,154 tons.

Coronation Syndicate.

Major H. A. Rogers, presiding at the annual meeting of the Coronation Syndicate, held in Barsdorf's Buildings this week, in the course of his remarks reviewed the company's position. The syndicate still held some 958 morgen of land in the Heidelberg district, while the company's holdings in the Africander Proprietary Gold Mines, Ltd., had been reduced to 15,826 shares owing to reconstruction of the company (Africander Proprietary G.M., Ltd.), shareholders receiving sixteen shares in the new concern for every hundred shares held in the old concern. The Coronation Syndicate's holding in the Machavie G.M. Co., Ltd., remained at 15,583 shares out of an issued capital of 85,000. Crushing operations had been continued on this property, fair profits being made. From the profit and loss account it would be noticed, Major Rogers went on, that the board had depreciated the syndicate's holding in the Africander Proprietary Gold Mines, Ltd., by £47,402 15s. 4d. The remaining assets had also been considerably depreciated from time to time and now appeared in the books at very low figures. It was hoped, the Chairman concluded, that with a return to normal conditions in South Africa and elsewhere, the syndicate would be able to participate in any new business offering. The report and balance sheet were adopted, the meeting concluding after usual formal business had been transacted.

Helping Developing Mines.

At the last meeting of the Springs Town Council the following resolution was passed and also another that it be sent to all Reef Municipalities inviting them to take similar action. The resolution is as follows:—"That this Council brings to the notice of the Administrator asking him to forward to the proper quarters the desirability of helping developing mines over their temporary monetary difficulties thereby avoiding them closing down and throwing out of employment a large number of employees, thus intensifying the distress which already exists. We bring this to his notice especially in view of the fact that several developing mines with the necessary capital subscribed find that at the present time money is not available on account of the financial outlook brought about by the war."

Manicaland Output.

The mineral output of the Territory of the Companhia de Moçambique (Manicaland) for the month of August, 1914, was as follows:—Reef: Mill: Gold won (fine gold), 233 ozs. 19 dwts. 11 grs.; tons, 917; value, £969 17s. 7d. Concentrates (estimated): Gold (fine), 2 ozs. 16 dwts. 0 grs.; tons, 139; value, £11 15s. 3d. Cyanide: Gold recovered (fine), 41 ozs. 3 dwts. 10 grs.; tons, 588; value, £170 13s. 1d. Alluvial: Gold recovered (fine), 1,088 ozs. 16 dwts. 5 grs.; cubic metres treated, 92,003; value, £4,513 10s. 4d.

WANTED TO SELL:

100 Daggafonteins. What offers? Reply to E.S., P.O. Box 3306, Johannesburg.

The Week's Company Meetings.

SIMMER AND JACK.

Year Reviewed.

Improved Labour Outlook.

Brighter Prospects.

The annual general meeting of the Simmer and Jack Proprietary Mines, Ltd., was held last week in the board-room, Consolidated Gold Fields Building. There were present Messrs. D. Christopherson, in the chair, C. H. Barclay, D. W. Rossiter, W. S. Smits, J. E. Kent, F. L. Brown, A. S. Ball, F. M. Cowan, and A. C. Grant, secretary. There were represented personally and by proxy 1,595,356 shares out of an issued capital of three million shares.

The Chairman said: Gentlemen,—From the reports and accounts for the year ending the 30th of June, 1914, which are now before you, it will be seen that, as compared with the working profit made last year, there is a decrease of £147,918. References to the reports of the superintending engineer and the manager will to a great extent explain this very considerable decrease, namely, that during the year under review 769,600 tons were crushed, giving a yield per ton of 20s. 7.496d., at a cost of 12s. 4.335d., while during the previous year 912,200 tons were crushed, yielding 21s. 3.496d. per ton, at a cost of 11s. 1.193d. per ton. The operations of the company have been severely hampered owing to shortage of native labour, caused to some degree by the industrial unrest which occurred in July, 1913, and January, 1914. This company has also suffered an additional disadvantage in that, up till recently, the natives employed have mostly consisted of boys recruited from East Coast and Tropical areas; in fact, the mine has always been practically an East Coast labour mine, so that when account is taken of the fact that recruiting results during the year in Portuguese territories south of latitude 22 deg. have not been up to the average of recent years, and, as you are aware, recruiting north of latitude 22 deg. has been prohibited, it will be understood how this mine's labour force has been more adversely affected than might otherwise have been the case. As a result, the company had to depend on making up wastage, caused by natives returning home, from other districts where the mine was little known, and, in consequence, recruiting was difficult, but, thanks to the Native Recruiting Corporation, this difficulty is gradually being overcome and the native labour position, during the last few months, has considerably improved, as the following figures show:

Total native labour strength at the 31st May, 1914, 2,884; ditto, 30th June, 1914, 2,465; ditto, 31st July, 1914, 2,649; ditto, 31st August, 1914, 3,096.

The recovery value for the year was 4.9 dwts. per ton, as compared with 5.05 dwts. the previous year, while working costs show an increase of 1s. 3d. per ton, which is not an unreasonable increase in view of the difficulties met with during the year.

Developed Ore Reserves.

The fully developed ore reserves at the 30th of June last were estimated at 2,320,000 mine tons of an average mine grade of 5.4 dwts. Development work during the year has opened up new points of attack from which development in the lower levels can be more rapidly carried out in conformity with the policy of your company as previously expressed. In addition to the above tonnage there is a partially developed tonnage of 348,000 mine tons of an estimated value of 4.6 dwts., and also there still remains considerable reclamation tonnage to be mined which is not included in the estimate of the ore reserves.

The development on the lower levels continues to show values well up to the average of the ore reserves. So far as can be seen to-day, there is no reason why, for the current year, the yield per ton should not approximate what was obtained last year, while the working costs must to a great extent depend on what tonnage can be crushed. This, in turn, is primarily dependent on the native labour supply. It has to be remembered that the reclamation rock, obtained from the higher levels, is gradually being exhausted. This ground is easily mined, and therefore the tonnage broken per native is high and, as the mine becomes more dependent on the mill being supplied from stope ore to be obtained from the lower levels, more natives will be required. There is not a very great deal of work to be done to complete the development of this mine, and it is desirable that the bulk of this work should not be delayed. By so doing it will assist our superintending engineer and our manager to regulate the mining and the grade in such a way as would be most beneficial to shareholders. But here again such a policy has to be, to some extent, subject to the native labour supply, which, as I have said before, to-day looks better than has been the case for some time past.

Sand Filling.

As stated in previous reports sand-filling operations at the Simmer and Jack have now been in satisfactory and economical operation for several years. Up to date nearly half a million tons of sand residue have been lowered for the support of mine workings, and in this way a considerable tonnage of ore has been recovered from pillars and other sources which would not have been obtained had sand-filling not been employed. The method of surface transport of residues required for this purpose developed on this mine has been adopted by others on the Rand and has been still further improved by recent experience and tests on the Simmer and Jack, resulting in economy in installation and operating costs. Preparations are now being made to extend sand filling operations considerably, whereby it is hoped that the whole of [illegible] current [illegible] ported in the [illegible] lowering, so that any [illegible] required for underground [illegible] can be delivered with [illegible] reduction in the cost and amount of residue sent to the surface dump.

During the year the plans of the [illegible] were confirmed and the township was proclaimed a [illegible]. This company's [illegible] of 39 morgen of ground [illegible] cut up into 242 [illegible] terms of the [illegible] by the Township Board, [illegible] holders (the Simmer and Jack Proprietary Mines, Ltd., being only the freeholders of [illegible] entitled to 75 [illegible] for endowment purposes [illegible] for light, water and [illegible] 17 [illegible] and the Government for public purposes to two stands. The [illegible] stands at the disposal of the company, of which [illegible] £3,083 17s. 6d., leaving 62 stands still to be disposed of. The negotiations as regards this township have taken many years, owing to various difficulties and complications that have had to be overcome, and our thanks are due to Mr. W. S. Smits, one of your directors, for the able manner in which he has handled the matter.

Outbreak of War.

The outbreak of war, which was so suddenly forced on Europe by [illegible] operations of the company. Satisfactory arrangements were made whereby companies are enabled to realise the value of the gold produced while regular shipments of gold are suspended.

As far as one can see to-day, supplies of stores and other necessary commodities essential to the continuance of operations will continue to come forward, so that no serious shortage is likely to occur. The satisfactory position in this respect is largely due to the assistance the Chamber of Mines has received from a committee formed by representatives of London houses interested in this industry, and also to the way in which the merchants of this town came forward and offered their cordial co-operation to maintain the output of gold from these fields. I can speak personally for your company and other companies under the control of the Consolidated Gold Fields, and in every case the [illegible] have acted up to their offer [illegible] to supply and [illegible]. As regards native labour supply, there is reason to hope that [illegible] supply [illegible] especially in view of [illegible] diamond [illegible] Under the above circumstances there is every reason to believe [illegible] Witwatersrand and [illegible] uninterruptedly.

On Active Service.

Already many of our [illegible] on active [illegible] is naturally a limit to the number of men who can be spared for service in the field; but our companies will meet the loyal desire of employes wishing to volunteer as far as possible, and those that can be spared will be allowed to go under the same terms as previously given to men already in the field, namely, that their positions will be kept open for them, so that they can take up their duties again when they return. Where a volunteer leaves behind him dependents, half pay will be allowed, and if, in certain cases, half pay is not sufficient to maintain the dependents further consideration will be given. In all cases the period of active service will be included in the period qualifying for leave under our leave regulations.

Your board much regret that the payment of the last dividend had to be temporarily postponed owing to the moratorium in England making it impossible to realise the necessary funds wherewith to pay out same. Every effort was made to shorten the period of postponement as much as possible, and the dividend was eventually paid out to shareholders on the 25th of August, instead of the 12th of August.

Management.

I should like to refer to the excellent work of Mr. Powell, the mine manager, and his staff. The disappointing results obtained last year cannot be laid at the door of these gentlemen. The industrial unrest already referred to and the acute shortage of native labour made their work difficult and arduous, but it is a pleasure to record the excellent spirit shown in meeting, and to a great extent successfully minimising the ill effects of,. these difficulties. I hope that during the current year conditions will be more favourable, thus enabling their efforts to result in returns more satisfactory to themselves and shareholders.

In conclusion, I should like to take this opportunity of referring to the untimely death of Mr. Thomas Douglas, who has been one of our auditors since 1896. It was in that year that Mr. Douglas first came to South Africa to take up auditing work, more especially for the Consolidated Gold Fields and that corporation's subsidiary companies. His conscientious work and his valuable advice, always so willingly and cheerfully given, have been of great service to those companies he has been connected with. His death is a loss, not only to the industry, but to this community, as he always took an active interest in public matters so long as his health permitted. Those of us who have for many years past worked with him and known him socially feel we have lost a faithful colleague and a good friend.

I now beg formally to move the adoption of the report and accounts.

Mr. Barclay seconded the motion and it was carried unanimously. The retiring directors were re-elected, the auditors reappointed and their remuneration for the last audit was fixed at 250 guineas each.

SUB=NIGEL, LTD.

Very Favourable Position.

Year Reviewed.

The sixteenth ordinary general meeting of shareholders in the Sub-Nigel Gold Mining Company, Ltd., was held in the Board-room, Consolidated Gold Fields Buildings, Mr. D. Christopherson presiding and the following shareholders being present: Messrs. W. S. Smits, F. L. Brown, J. E. Kent, D. W. Rossiter, P. Dreyfus, H. J. Raubenheimer, A. S. Ball, J. H. Leslie, F. M. Cowen and A. C. Grant, secretary. There were represented personally and by proxy 246,689 shares out of an issued capital of 431,580 shares.

The Chairman, in his opening remarks, said: Gentlemen,—From the balance-sheet before you it will be noticed that property account has been increased by some £3,000. The explanation of this is that during the year under review the company acquired a further 119.150 claims at a total cost of £165. These claims are adjacent to, and surround, one of the water-rights in which this company is interested. The claims were pegged in the first instance by the Consolidated Gold Fields of South Africa, Limited, and thereafter acquired by this company at the actual cost price. In addition to the above, the company acquired the freehold of 608 morgen of the unproclaimed portion of the farm "Bultfontein." The purchase of this ground, together with the pegging off of two additional water-right claims on the Blesbok Spruit, was necessary in view of the water position becoming somewhat serious, due to the shortfall of rain during the last few years. These steps have put the company in a good position as regards the water supply, and we hope there will be no further trouble in the future in this respect.

Exploratory Development Account now stands at £14,109. This money has been spent on exploratory work, mostly in the neighbourhood of E Shaft, and the amount will be either eventually gradually written off through working costs when the larger tonnage, referred to later, is crushed, or otherwise dealt with as may be hereafter decided.

On reference to the figures detailing our cash assets, you will observe two items appearing on the credit side of the balance sheet, viz., "Loans against Security, £117,500," and "Fixed Deposit, Johannesburg, £102,000," which need some explanation. Shortly before the close of the financial year of the company your Board decided to transfer to Johannesburg £110,000 of the funds on loan in London, an item for which amount appears on the debit side of the balance sheet under the head of "Drafts in Transit." Of the cash so transferred £102,000 was placed on fixed deposit with local banks for varying terms at satisfactory rates of interest. Since the close of the financial year the draft for £110,000 has been presented and paid in London, and the item of £117,500 has therefore been correspondingly reduced.

Working Profit.

The working profit, i.e., excluding sundry revenue, for the year amounted to £19,202. This is a considerable decrease as compared with the working profit last year and is mostly accounted for by the yield per ton having been 37s. 6.5d., as compared with 39s. 3.8d., while working costs for the year under review show an increase of nearly 1s. 2d. per ton. Expenditure on development was considerably increased, which increased the amount charged to working costs for development to 3s. 2d. per ton, as against 1s. 7.5d. last year.

The ore reserves as at the 30th of June, 1914, are estimated to be 160,000 fully developed mine tons of a value of 7.2dwts. and 69,000 partially developed mine tons of an indicated value of 8.5dwts. From the superintending engineer's report you will note that the tonnage and value of these reserves have this year been calculated on an increased stoping width of about 2.1 inches, in order to "conform with larger stoping widths now prevailing, due partly to difficulty with hanging wall in the D shaft section, and also, to some extent, to an increased proportion of machine stoping." In view of the development work, as it proceeded last year, exposing encouraging values, your directors discussed the important question of increasing the capacity of the plant in order to deal with a larger tonnage. They finally decided to increase the nominal capacity of the plant and reduction works to 8,000 tons per month, being an increase of about 70 per cent. The cost of carrying out this work is estimated at £46,300, the principal items of expenditure being:

Additions to headgear, sorting and reduction plant	£19,000
35-drill compressor	3,700
Extension of boiler plant ..	4,800
Employes' accommodation, European and native	5,200
Electric generating plant	4,000
Underground loading station and sump	5,000
Condenser plant	800

The ore reserves to-day, including the partially developed ore, would show ore for two years ahead of the mill on an 8,000 tons per month basis and development work is being extended so as to give working faces from which to maintain the full rate of tonnage required. Provided payable ground continues to be opened up as expected in B and D shafts, the ore reserve should be increased during the year. Before authorising this expenditure on the extension of plant, your directors fully considered the advisability of delaying this extension till further work has been completed in E shaft, but, in view of encouraging reef exposures it was thought that it was a reasonable risk to take. At the present time, though some good values have been exposed in the E shaft district, there has not been sufficient work done to give evidence as to the areas over which these values may extend, but, as stated above, the indications encourage the hope that considerable areas will be opened up. For instance, a winze which has been sunk 120 feet from the lowest level in E shaft shows continuous payable values, while on the top level going west, good values are found over a limited area. A drive is now being put in from the bottom of E shaft, going west, but it is now in dyke, and it is expected that a considerable footage will have to be done bofore payable chutes, which it is hoped to find, will be met with. Should the efforts to open up large payable areas in this section of the mine be successful, it will be a matter for further consideration after an interval, as to the advisability of still further increasing the crushing capacity of the plant, and the work which is now being done in this respect has been laid out in such a way as to allow any further extension to be carried out at a minimum cost.

Favourable Position.

The position of your mines to-day compares very favourably with what was the position at the end of the last financial year. The values exposed during last year on the lower levels in B and D shafts are quite satisfactory, and it only requires a continuance of the satisfactory development in E shaft to safeguard the position further and to give justification for sinking a vertical shaft to serve the larger western area which it is hoped will be worked profitably in the future.

From the manager's report you will notice that C incline shaft has been widened and is now being sunk further with the object of making it the main hoisting incline, to which eventually all rock from B and D shafts will be trammed. By this arrangement the ore will be delivered direct to the plant and a considerable saving of surface transport of ore will be effected.

In view of the outbreak of war, the work of increasing the crushing capacity of the plant may not be finished as early as was anticipated, but it is hoped that towards the end of the next financial year it will be possible to bring the new plant into operation. In the meantime, now that the new 35-drill compressor has been erected this will enable development to proceed at a greater rate.

Mr. Douglas's Death.

Before concluding I should like to take this opportunity of recording our very sincere regret at the death of Mr. Thomas Douglas, who has been one of the auditors of this company for many years past. Throughout his long connection with this company, his duties have always been carried out in a most conscientious way and his willing help was always freely given when advice was asked. From the report it will be seen that the firm of Messrs. Douglas, Low and Co. have been nominated as one of the auditors of this company. Some months ago Mr Douglas took into partnership Mr. J. D. Low, who was for many years in charge of the Consolidated Gold Fields Secretarial Department. Mr. Low will continue to carry on the business of this firm and should shareholders agree to this appointment, I have every confidence in Mr Low carrying on the work to the entire satisfaction of shareholders. I now beg formally to move the adoption of the report and accounts.

The report was adopted without discussion, Messrs. F. D. P. Chaplin and J. H. Leslie, retiring directors, were reelected while the appointment of Mr. F. Leslie Brown as director was confirmed.

The meeting thereupon concluded.

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NATIONAL BANK.

Natal Bank Absorption.

Details of Scheme.

An extraordinary general meeting of the shareholders of the National Bank was held at Pretoria, the Hon H. Crawford presiding. Others present were **Mr. Emrys Evans, C.M.G., Mr. P. Duncan, M.L.A., Messrs. E. R. Syfret, H. A. Rogers, E. Renaud, Senator Viljoen, Sir E. Walton, H. O'K. Webber, W. W. Calder, R. B. Edwards, L. E. French, E. Rook, A. Moore, E. C. Reynolds (General Manager), and C. P. Mathews (secretary).**

The chairman moved:

That the capital of the bank be increased to £3,000,000 (three million pounds) by the creation of 65,000 (sixty-five thousand) shares of £10 (ten pounds) each, to be issued in such manner and on such terms as the directors shall from time to time determine.

and in doing so, said:

In terms of the notice convening this meeting you are asked to give power to increase the capital of the Bank by 65,000 shares, being the equivalent of £650,000. The primary reason for seeking this power is to provide 50,000 shares to complete the purchase we have made of the Natal Bank. The sale of that institution was confirmed on the 28th September by its shareholders, and we thus acquire its business and goodwill. The main object of the amalgamation is to give us better representation in Natal, in which Province the Natal Bank has been established for some sixty years. It has enjoyed a well-deserved popularity, and its branches are established at all the principal points. The clients of the Natal Bank should welcome the larger financial machinery which the National Bank can offer them, owing to the number of its branches in other parts of the Union, and to the fact that its large capital will enable it to negotiate transactions of greater magnitude than a smaller institution could undertake.

Although the name of the Natal Bank disappears by this fusion, provision has been made for Natal to be well represented on our Board. Three of the late Natal Bank directors will join us, and, further, at least one member of their London Committee will be added to ours. We take over all of their staff, and so far as the public of Natal is concerned, scarcely any change will be noticeable by them, and they may rely upon receiving generous treatment by the National Bank.

The amalgamation will no doubt enable us in a short time to work the united business more economically economically; for instance, by closing one of the two branches at those points where both banks are represented; but be this as it may, we feel assured that the fusion will be to the ultimate benefit of all interested.

Some of you may ask why we entered into this amalgamation at such an ultra-abnormal time, when as a natural consequence there is a financial upheaval, and some of the most important parts of the investing world are cut off. The answer is that when we concluded the provisional agreement the political and financial horizon was quite clear, and it was during the interval which had to take place before the shareholders could meet that war came suddenly on us.

Main Features of Agreement.

The main features of the agreement with the Natal Bank are the acquisition of its business and goodwill as a going concern in exchange for fifty thousand fully paid-up shares of the National Bank, to be distributed, pro rata, among the shareholders of the Natal Bank. The purchase covers all the assets of the Natal Bank, exclusive of the reserve fund and accrued and estimated profits from the 31st of December, 1913, which together amount to, say, £400,000. This sum will be paid by such assets (taken at book value) of the Natal Bank as we may select. These assets are to be liquidated on behalf of the shareholders of the Natal Bank, and the proceeds distributed among them in proportion to their holdings. The shareholders of the Natal Bank are to participate in any dividend paid by the National Bank in respect to profits earned after the 30th of September. The National Bank assumes all the liabilities of the Natal Bank, and, as I have said, takes over all their officials. A further condition is that we agree to allow the Natal Bank shareholders an option to exchange their present holdings for shares in the National Bank or to take cash calculated at £11 10s. per share. The option expires on the 1st of October, when any shareholder who has not otherwise notified our head office in Pretoria will be allotted shares. There is no doubt that could fusion have taken place at the time the provisional agreement was signed practically every Natal Bank shareholder would have accepted our shares. Owing to the present hostilities, the moratorium in most parts of Europe, and the closing of all principal Stock Exchanges, a quite unique position has arisen. And recognising this, we expect some Natal Bank shareholders may by stress of circumstances be almost forced to ask for cash. We much wished to see all their shareholders become our shareholders; and we regret that those who exercise the option will lose the higher value our shares will undoubtedly command when peace is restored.

You are asked to give power to increase the bank's capital to the round sum of three millions. The reason for this is to save the calling together of shareholders again, should the board consider it advisable to issue further shares to the extent mentioned. Your directors will in this be guided by circumstances, and will adopt the course most likely to advance the interests of the bank.

Future Prospects.

This being a special meeting called for a specific purpose, I do not now propose to trench on the resume of the Bank's affairs due to be given at the next ordinary general meeting. But I may say that, considering the European conflagration and its far-reaching effects, we have every reason to be pleased with the course of of our business, and we are optimistic and feel sure that directly the war cloud lifts, we shall see a period of great prosperity for this country, in spite of the daily destruction of such a vast amount of capital. Naturally the world at large will suffer for a long time from this huge loss of capital, and some few years must elapse before this loss can be balanced by the creation of new capital to be derived from the development of natural resources and from the savings of the community at large. Meanwhile, some countries will feel the pinch of the times, perhaps acutely; whilst Governments and Municipalities may find it more difficult to raise loans at reasonable rates. Nothing can allay our feelings of sorrow at the fearful carnage of war, but if there be a solatium it may be that the craving for undue luxury, which is as bad for a nation as an individual and which was becoming a marked feature of the age, may cease, and be followed by the turning of the energies of our peoples to permanently useful and good objects. But looking at the matter solely from this country's point of view, I cannot help feeling that given a few favourable seasons, we ought to enjoy a good return from the development work which has been proceeding all over the Union. And this Bank with its enlarged sphere of action and the new connections it is now in a position to form, should share in this hoped-for era of prosperity. By the adoption of the proposal now submitted, the scheme we first contemplated about five years ago, will be completed. We have no further amalgamation in view. The acquisition of the National Bank of the Orange Free State and the Bank of Africa both proved of great value to us, and we confidently predict that a similar result may be expected from the business we are now acquiring. Our capital and reserve will thus amount to £3,550,000, which is a substantial security for our depositors.

The resolutions were unanimously adopted, as were other formal ones amending the Articles of Association to meet the situation created by this extension of operations.

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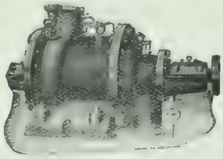

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CREDIT MOBILIER FRANCAIS,
Secretaries to the Liquidators.
per J. JOURDAN.

Head Office: Johannesburg, 28th September, 1914. 35823

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PRICE 6d.

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Local Delivery (Town Only) - - -	*£1 6s. 0d.*
South Africa (Postal) - - - -	*£1 10s. 0d.*
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South African Mines, Commerce and Industries.
ESTABLISHED 1891.

VOL. XXIV., PART I.] OCTOBER 10, 1914. [No. 1202.

HEAD OFFICE: 176-180, Stock Exchange Buildings, Fox Street (2nd Floor), Johannesburg, Union of South Africa.

Telephone **913.** P.O. Boxes **963** and **418.**

Cable and Telegraphic Address: **"MININC JOURNAL."**

AGENTS FOR GREAT BRITAIN: Argus Printing and Publishing Co., Ltd., Byron House, 82-85, Fleet Street, London, E.C.

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ANNUAL SUBSCRIPTION RATES: Oversea, £2; South Africa (by post), £1 10s.; Local Delivery (Town only), £1 6s.

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NOTICE.—The postage of this issue of the *S.A. Mining Journal* is: South Africa, ½d. All other parts, 1d.

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Notes and News.

Far East Rand Prospects.

Despite his military activities, it is cheering to note that Colonel Dalrymple never misses an opportunity to help along the industry upon which we all live. At the Kleinfontein Estates meeting a few days ago, he paid a valuable tribute to the prospects of the Far East Rand, which is now shaping so well and which will come into its own "when the war is over." "Marked progress," he declared, "has been made in the development of the mineral resources of the district. The Van Ryn Deep has become a most important factor in the production of gold. You have, moreover, the Modderfontein and the Modderfontein B. gradually expanding their operations. The Modderfontein Deep will reach the producing stage at no distant date. On the Government Areas development is proceeding satisfactorily, as also the erection of the ore reduction works. In addition to the aforementioned, the Van Ryn and New Kleinfontein in the immediate vicinity are carrying on their operations in a normal manner. The New Kleinfontein Company has absorbed the Benoni Consolidated Gold Mines, and the gold section of the Apex Mines, and a guarantee was obtained for working capital sufficient to increase the ore reduction of the join properties from 50,000 to 75,000 tons per month. The issue of shares, however, has had to be postponed owing to the conditions of war prevailing."

* * * *

Modder Deep: Development Results.

The following particulars are supplied of work done on the property of the Modderfontein Deep Levels, Ltd.:—During the quarter ended 30th September last, 2,673 feet were driven, risen or sunk, inclusive of 52 feet sunk in the main incline shaft. 2,395 feet were sampled, showing an average assay value of 9·8 dwts. per ton over 50·7 inches. Since the commencement of development work a total of 29,000 feet has been driven, risen or sunk, of which 23,867 feet have been sampled and show an average assay value of 9·28 dwts. per ton over 47·2 inches.

* * * *

German Foreign Trade.

Sir Francis Oppenheimer, who was British Commercial Attaché at Frankfurt-on-Main, forwarded to the Board of Trade before the outbreak of war information regarding the efforts made to increase German trade and industry abroad. According to his statement, which appears in the *Board of Trade Journal*, German manufacturers, merchants and shippers interested in the same markets combined to form special societies for nursing those markets. The societies had the moral support of the highest official quarters in Germany. A union was formed by the societies so that the members could benefit from each other's experience. This showed how the necessity of an increased export trade was officially and privately recognised and how it was made the object of special care. Independently, vast sums of German capital were constantly being invested in industrial settlements abroad.

* * * *

Stock Exchange Settlements.

The Committee of the London Stock Exchange has decided that Consols accounts for August, September and October will be settled on November 18, the November account on December 1. Ordinary accounts up to October 14 will be settled on November 18, while those for settlements of October 29, November 25 and 26 will be settled on December 1.

* * * *

McCreedy Tins and the War.

At the general meeting of shareholders of McCreedy Tins (Swaziland), Ltd., held last week, Mr. H. Grumann, who presided, said that the year under review had been an exceedingly difficult one inasmuch as the price for metallic tin had fallen considerably and the price of tin, as they would readily realise was an important factor in the success or otherwise of a venture like the one they were working. This was clearly demonstrated by the fact that the average price realised for the tin during the year under review was £177 10s. per ton as compared with £214 10s. 2d. for the previous year, and now, with the war on them they could not rely on markets because they were bound to be uncertain and of a very fluctuating character. The question of how best to dispose of the output was also one for consideration because they were anxious, naturally, to sell to the greatest advantage. This consideration was always well before the Board and received the most careful attention. He had no misgivings as to the future and all they could do now was to possess their souls in patience.

* * * *

The Modder Deep Levels Increases Capital to £455,000.

The secretary writes:—I am directed to advise you as follows, for publication in your esteemed paper: The option over 105,500 reserve shares, which expired on 30th September, was exercised in part, and the Board has made new arrangements as regards the unexercised portion. As a result, 60,500 shares have been subscribed at 35s. per share, making the total issued capital £455,000, while the remaining 45,000 reserve shares continue under option at 35s. per share until 31st March next. Construction to complete the surface equipment is proceeding satisfactorily, and it is expected that production will start during December.

* * * *

Zinc Position.

An important, though hardly cheering, circular has just been issued to Zinc Corporation shareholders by the directors, in which the position of the undertaking is reviewed having regard to the outbreak of European war. Unfortunately, the circumstances are such that "the directors regret that it is not possible to earn dividends," and anticipating that it will be at the best a lengthy period before the Continental smelters will be able to cope with the supply of concentrates or the demand for spelter, they are giving careful consideration to the question of Zinc Corporation erecting its own smelters with the double object of increasing its profits and the removal of this business from Germany to England.

* * * *

A Patriotic Firm.

It is noteworthy that up to the end of last week about nine hundred of the British Thomson-Houston Company, Ltd., employees from Rugby had left to join His Majesty's Forces. This represents more than 50 per cent. of all the employees of the company who are within the eligible age limit. The company is giving these men half pay while they are away on duty, and intends to reinstate them upon their return. This offer on the company's part has of course encouraged volunteering on the part of the men, and Lord Kitchener has expressed by letter his grateful appreciation of the manner in which the employees of the B.T.H. have responded to his call for men.

* * * *

The Messina's Product.

So far the war has had little effect upon the position of the Messina (Transvaal) Development Company. Mining operations are still in progress, and production is likely to be continued so long as the concentrates produced are marketable. The company's output is shipped to Wales, and so far, we understand, no difficulty has been experienced as regards disposing of the ore.

* * * *

British Gold Resources.

With regard to the British gold reserve there have been many suggestions and proposals of increase during the past few years, on the ground that it was not sufficient to meet any such emergency as has arisen. The measures taken by the Bank authorities and the Government have, however, very considerably strengthened the monetary position since the declaration of war, and every day brings added resources. A most important step for the restoration of credit and the facilitating of normal channels of exchange has been taken by the Government, which has agreed to guarantee the Bank from any loss it may sustain by discounting bills of exchange accepted before the declaration of war, on August 4. The paralysis of the foreign exchanges had made bills unsaleable, and the banks and brokers were unable to do business of that nature owing to the fact that much of their money was in this manner locked up. The Government's guarantee will release those funds, and the discount market will be able to resume business. The Bank declares further that, backed by the Government, it is not only ready to discount such bills as formed part of its customary former business, but that it will extend its financial services by the discounting of good trade bills, and the acceptances of such foreign and colonial firms and banking agencies as are established in Great Britain.

* * * *

Dividends to Enemy Countries.

The following circular has been issued by the Inland Revenue to bankers, agents entrusted with the payment of foreign and colonial dividends and coupon dealers:—"The Board of Inland Revenue have had before them a notice issued by the Board of Trade warning all joint stock companies and their officers that 'no dividends or interest declared or becoming due after the outbreak of war should be paid during the war to or in accordance with instructions from any person resident in enemy territory,' and stating that 'such dividends or interest should be paid into a separate account at a bank to be disposed of after the conclusion of the war.' The warning is applicable to dividends and interest of Foreign and Colonial Government securities and foreign and colonial companies, and in this connection I am directed by the Board of Inland Revenue to inform you that they are unable, during the continuance of the war, to accept declarations made by or on behalf of persons resident in enemy territory by virtue of which income-tax is not collected on the dividends or interest accruing to such persons. Where an agent in this country entrusted with the payment of foreign or colonial dividends or interest, or a banker or coupon dealer in this country who has collected dividends or interest from the paying agent, has paid or hereafter pays such dividends or interest into a separate account at a bank, with a view to their being disposed of after the conclusion of the war, the income-tax thereon should be deducted and accounted for from time to time in the periodical returns in respect of foreign and colonial dividends made by paying agents, bankers and coupon dealers to the Board's Inspector of Foreign Dividends at York House, Kingsway, London, W.C."

* * * *

The U.S.A. and Our Trade.

This is the time for American manufacturers to be alive to get their share of the export trade with South Africa and other British Dominions that is surely going to develop, says a New York contemporary, in a significant article. "The development of such a trade from the United States has been a dream for many years, and some serious efforts have been made by some interests, like the U. S. Steel Corporation, to create it, but in general we have not made the headway that we hoped. In general, American manufacturers have been too inert, too little disposed to go out for foreign business, and consequently unwilling to take the trouble to study the nature of foreign requirements and the methods that must be followed in order to do business abroad. British and German manufacturers, but especially the latter, have been quite different. Their travellers have scoured the world, have studied the local requirements, have reported home, and their manufacturers have been alert to supply what was wanted. Now we have the unique condition that the foreigners must come to us in order to get what they need, their previous sources of supply having been cut off. No longer do we have to cater especially to them, inasmuch as they are coming to us, begging us to furnish them with what we have got. Yet, it behoves our manufacturers to meet them half way, or at least a quarter way. Those who are ready to do so will reap great reward. Already, we are reading in the commercial papers about the inauguration of new business with foreign countries, and we hear privately of numerous demands for mining supplies. We foresee in the very near future the growth of an important export trade, first probably in the staple commodities, and later in the higher grades of manufacture. In the way of mining and metallurgical supplies, we shall doubtless export to South America and elsewhere, such things as dynamite candles, cement, calcium carbide, structural steel, pipe steel rails and track material, sheet steel, galvanized iron, copper wire and steel wire, firebrick, roofing material, shovels, rubber hose, rubber, leather and canvas belting, assay supplies, wire cloth, roll shells, and other crusher parts, steel castings, power-transmitting machinery, lubricants, mining machinery of all kinds, electrical machinery, etc. The new demand for these and many other things is coming. Enterprising manufacturers will prepare for it. The shipping facilities are being provided, and banking interests are rapidly making arrangements for direct exchange between New York and South America. The Panama Canal, through which commercial ships are now passing, was opened very opportunely in view of the commercial conditions that have subsequently come about. Now let our manufacturers and merchants be enterprising and energetic."

* * * *

Progress of the Transvaal Iron Industry.

According to the Secretary for Mines, the objects of the inducements held out by the Union Government in regard to the iron industry are on a way to being achieved. Rolling was commenced at the works of the Steel Corporation at Vereeniging on the 1st of August, 1913, and a Siemen's steel melting furnace was started on the 1st September, 1913, upon which date the first ingot of steel produced in South Africa was cast. The full equipment of the works consists of a 10 to 12 tons Siemen's open-hearth melting furnace, a 600-ton press, two Siemen's reheating furnaces and a 12-inch rolling mill. The whole plant is covered in by exclusive buildings of galvanized corrugated iron. The scrap yards now contain roughly 20,000 tons of scrap, of which about 16,000 tons had been removed by the corporation from the Pretoria depöt of the Railway Administration. The material produced consists of bar iron and steel of all sections, fencing standards, light colliery rails, and so forth. The number of men employed at the works of the corporation is about 100 Europeans and 90 natives. Most of the skilled operatives have necessarily been brought out from England under contract, but a number of men of the labouring class—both Dutch and English—have been recruited locally and are developing into useful quasi-skilled workmen. The output has not yet reached the maximum capacity of the plant, but progress towards this end is steady. There are evidences, however, that the company is meeting with difficulties, especially in the disposal of its products. Advantage was taken of the visit of the Government Mining Engineer to Europe during the year to make inquiries into the production of iron at the works of the Höganäs Company on the Swedish coast, opposite Copenhagen, it having been suggested that the process might be employed for the reduction of iron ores in this country. The report, however, is not encouraging.

Brakpan Mines.

The results of the operations of the Brakpan Mines last month were as follows:—Stamps working, 140; running time, 28 days; ore crushed, 53,400 tons; tube mills working, 9; ore hoisted, 61,032 tons; ore from dump, nil; waste sorted, 12·34 per cent.; fine gold declared, 17,392·08 ozs.; value declared, £73,157; equal to 27s. 4·80d. per ton milled; working costs, £47,235; equal to 17s. 8·29d. per ton milled; working profit, £25,922; equal to 9s. 8·51d. per ton milled.

Glasgow and South African.

The report of the Glasgow and South African Company, Ltd., states that the board recommend a dividend of 5 per cent., free of tax. A sum has been placed to reserve of £1,000, leaving a balance of £591 to be carried forward.

TOPICS OF THE WEEK.

IMPROVING INDUSTRIAL OUTLOOK.

THE outlook improves steadily, and every department of business and industry is beginning to feel the effects of the growing confidence. The news from Europe is, on the whole, most gratifying, and the final triumph of the forces fighting for peace and civilisation is more than ever assured. Time is with us, and every day sees the disturbance to credit and the dislocation of business, in greater measure, remedied. The Rand industry, as will be seen from the gratifying returns for September presented in this issue, despite a few untoward incidents that have affected individual producers, continues to pursue the even tenor of its way. The heartening messages of leaders of the industry are being amply confirmed, and the danger of any interference with the normal processes of Rand mining and metallurgy seem more remote than ever. Indeed it is gratifying to know that some of the steps hastily decided upon in order to maintain at all costs the supplies of chemicals required for the future normal working of the industry have, in view of the improved outlook, been now found unnecessary. We refer more particularly to cyanide, the future supply of which from Great Britain is now assured. But the best and truest index to the improved position is to be found, as formerly, reflected in share prices, and quite a brisk cash business is said to be growing up in Rand gilt-edged stocks. In London, one of the first results of the decisive turn of the tide of war has been that a step has been taken toward the reopening of the Stock Exchange. Naturally, the step is a tentative one, and whether it will be followed up or not will depend largely upon the confidence of the investing public in the ultimate outcome of the present struggle, but the fact that it has been made is in itself an encouraging sign. The plan adopted may be briefly described as the fixing of minimum prices for dealings for cash in gilt-edged stocks and Trustee securities. Dealings below these figures by any members of the House are prohibited, and a basis is thus established from which it is hoped that a working level of dealing prices can be built up. As regards the level of prices furnished, the quotations obtaining on the 30th July have evidently been taken as a guide in most cases, but in a fair number of instance the "starting price," as it may be termed, has been fixed a little lower. At the same time it should be understood that, in the opinion of those who framed the scheme, the dealing level of prices is likely to be substantially higher within a very short time should the war news continue favourable, and any considerable amount of business be transacted. Should the plan succeed, it is probable that the list of securities dealt in will be gradually extended, but for the present, at all events, all transactions must be on a cash basis, and no one wishes to see any speculative business entered into. The point for us, of course, is the fact that Rand shares are again beginning more freely to change hands.

FINANCIAL AND COMMERCIAL QUESTIONS IN WAR.

OUT of the welter of financial and commercial questions evoked by the war, two may be said to command most attention in South Africa at this moment. The first is the vexed one of trading with "alien enemies," and the second, the disposal of the export trade lost to Germany. In regard to the first, the same difficulties are being experienced in South Africa as in Great Britain; and in solving them we cannot go far wrong if we follow her example. So far, despite the attempt made by the British Attorney-General, Sir John Simon, the position is not cleared up, and a final definition of "alien enemy" is still to seek. The problem arises from the fact that there exist in the United Kingdom and in these Colonies many firms which are affiliated with German houses. A definition propounded by the British Engineers'

Association makes an " enemy " of any firm which possesses interests in foreign manufactures or other foreign interests which might be antagonistic to British engineering. Thus the mere possession of works in Great Britain does not in itself absolve the firm. With a large body of opinion, we are not prepared to admit the soundness of this view, although we fully recognise that it has much to commend it. To our minds the destination of the profits made in the course of manufacture and trade is of less importance than the distribution of wages. At any rate, the Trading with the Enemy Bill was passed in mail week, with amendments.

In regard to the second great question of the moment, the disposal of the lost export trade of Germany, big efforts are now being made by their respective Presses to awaken British and American exporters to the possibilities. South Africa, it is hoped, will not remain supine in the matter, and recent appeals will, it is hoped, produce fruit. In so far as the campaign now being begun on behalf of British manufacturers goes, it should be noted that it depends, of course, on other factors besides those of information and advice, which have monopolized attention up to the present. The Imperial Government has done much by backing up the Bank of England's position to facilitate dealings in bills of exchange and to open up the ordinary channels of international trade. These efforts need to be strengthened and rendered effective by the harmonious co-working of the banking establishments, of credit institutions of all kinds, of the insurance companies, and the shipping interests. Railway rates and freight rates will need early attention; and factories and workshops (even assuming that the raw material is easily available or in hand) cannot turn out goods without elasticity in the extension of credit, especially to the smaller men who are first and hardest hit in an emergency like the present. Moreover, if the success obtained by the movement for extending British trade in foreign and colonial markets is to be permanent, the question of price must be considered, and into this matter the present freight rates enter very largely. In fact the movement must proceed on lines which constitute a new departure, called forth by the new circumstances and the great opportunities which may never recur. " What is wanted at this crucial moment is joint effort on the part of the State, manufacturers, merchants, shipowners, insurance companies, individual firms, and the workers. Healthy competition cannot be ruled out, but at the moment what is wanted is concerted effort." The essential importance of promptitude and study of conditions on the spot has been speedily recognised as necessary for developing British trade with South Africa, and already one or two prominent representatives of manufacturing concerns in the United Kingdom have set sail for this country, and others are to follow. Speedy arrangements for opening up business connections, combined with an energetic prosecution of up-to-date business methods, are necessary; for, although the prospect is reassuring, business must be keenly struggled for.

THE UNION COAL INDUSTRY AND THE RAILWAYS.

Owing mainly to the increased assistance afforded by the South African Railways, the coal trade of the Union—apart from the Rand—continues to show gratifying signs of expansion. In 1913 there was a decrease of 291,436 tons in public coal consigned to the Witwatersrand as compared with 1912. The results for 1913 show also a material reduction on the figures for 1911, due to some of the gold mines having closed down. There has been an increase in coal traffic to other points; but the traffic to the Witwatersrand area still represents 32 per cent. of the total coal traffic, as against 40 per cent. in 1911. The General Manager, in his annual report for 1913, does not anticipate that the tonnage in this traffic will fall materially below these figures. There has been an abnormal increase in coal traffic to Delagoa Bay of 302,192 tons, or 78·5 per cent., over the tonnage for 1912. On 1st October, 1913, a low rate was introduced for coal conveyed overland from the Transvaal, Orange Free State, and Natal collieries to the Cape Provinces. This rate to Capetown amounts to 14s. per ton from Witbank, and 14s. 10d. from Hatting Spruit. A rebate of 1s. is allowed from these rates when the coal is for bunkers. Sufficient time has not yet elapsed for the full effect of this alteration to be felt, although it may be expected that it will give a stimulus to Capetown as a coal bunkering port, and generally enlarge the markets available for South African coal, thus benefiting the collieries throughout the Union. The tonnage of Natal coal exported to Cape ports decreased as compared with last year, but generally the prices of Natal coal have been higher, and as affording evidence of the fact that the market for Natal coal has been buoyant it may be mentioned that in the 1913 report of the Glencoe (Natal) Collieries the chairman states that the agents of the company would have had no difficulty in disposing of the whole of the output, and could have sold much larger quantities had the mine been able to put it out. This would seem to indicate that so far as this mine is concerned, the competition at Cape ports of the Transvaal collieries has had no adverse effect, and the General Manager is not aware that the experience of the Glencoe Collieries in this connection is in any way peculiar from that of the other collieries in Natal. The new coal rates have given an impetus to long-distance traffic, and in November and December 23,000 tons of coal were consigned to Capetown for bunker purposes. This traffic is likely to be permanent, and although the reduced rates were not operative until late in the year, the contracts entered into with shipping companies are considered satisfactory. The delay to trucks under load with coal at Durban has shown a further slight improvement. The figures of the quantity of coal under load daily for the four months ended December, 1913, were 10,874 tons, against 11,250 tons for a similar period in 1912. The Railway Administration is chiefly concerned with the release of rolling stock so that the traffic may be handled to better advantage, and if possible with fewer trucks, but it is equally desirous of assisting the traffic through the respective ports. The increase in the coal traffic during the year 1913 was fair, and satisfaction has been expressed regarding the manner in which it has been handled. The additional trucks placed in service have been of great assistance, but the most important factor has been the alteration in the system of control of the distribution of rolling stock. Prior to July the movement of rolling stock was dealt with locally within the respective divisions. It was decided that the control should be centralized in one office through which the requirements of the whole system could be reflected and through which the general distribution and movement of rolling stock would be controlled. The altered system is more than justified. The Railway Administration has been severely criticised by the coal mining industry in the past in regard to the supply of trucks for coal traffic. The system of central control which has been inaugurated has, however, gone far to meet the difficulties complained of, and as evidence of this the General Manager quotes the remarks of the Chairman of the Witbank Colliery, Ltd., in reviewing the operations of the company during the year ended 31st August, 1913: " Your consulting engineer mentions that the output for the past year would probably have been greater had it not been for constant shortage of railway trucks. This question of the shortage of trucks was brought prominently forward a few months ago, and then received the fullest consideration of the Railway Administration and the Transvaal Coal Owners' Association. The outcome of the discussions which then took place was an assurance from the Minister that the question would receive immediate attention, and he anticipated there would be no cause for complaint in the future. This question in past years has been a source of trouble to the collieries, and therefore I have much pleasure in informing you that since the discussion with the Railway Administration there has been a sufficient supply of trucks."

POSITION AND PROSPECTS OF THE CONSOLIDATED MAIN REEF

Outlook Better Than Ever Before—Improved Profits Expected From Favourable Labour Conditions—Last Year Reviewed.

Year	Tons Milled.	Total Yield.	Yield per ton Milled.	Cost per ton Milled.	Profit per ton Milled.	Total Profit.
1913	266,055	£407,255	30s. 7·37d.	20s. 1·61d.	10s. 5·76d.	£139,415
1914	241,007	£379,551	31s. 5·96d.	21s. 9·84d.	9s. 8·12d.	£116,609

THE prospects of the Consolidated Main Reef, as reflected in the annual reports of the company, to be submitted at the meeting on the 27th proximo, are excellent. For the year ended June 30 last the tonnage crushed shows a decrease of 25,048 tons, with a corresponding reduction in profits earned of £22,806. The working profit for the year amounts to £116,609, but to this sum £3,666 must be added, being the value of gold obtained during June from the final clean-up of certain plates which will not be required in the new tube mill plate house, to which a portion of the battery plates has been transferred. The payable ore reserves show an increase from 614,470 tons, valued at 7·32 dwts. over 48 inches, to 693,460 tons, valued at 7·34 dwts. over 48·6 inches. The directors' report shows that the credit balance brought forward from last year was £58,659; profit on working for 1914 was £120,275; owners' share of claim licences, interest, freight rebate on gold and sundry revenue, £12,747; making a total of £191,682; from which have to be deducted:—Government tax on profits for 1913, £10,056; audit fees for 1913, £315; shaft sinking, £12,459; dividends 11 and 12 declared during the year, £92,436; directors' extra remuneration in accordance with the company's articles of association, £1,700; sundry items, £3,577; contribution to Miners' Phthisis Compensation Fund, £5,715; total, £126,259; leaving a balance to be carried forward of £65,423. The following items of capital expenditure have been incurred during the past year:—Buildings, £3,666; machinery and plant, £30,463; shafts, £27,259; investments, £131; total, £61,521; less—proceeds of sale of freehold stands in Maraisburg, £520; stable equipment written off, £552; dams and surface work—amount refunded, £255. Of this total a sum of £12,459 5s. 9d. has been written off against the year's profits, the remainder being provided from the amalgamation in 1909, the balance of cash available from this source being at 30th June, 1914, £40,120 17s. 9d.

The consulting engineer, Mr. D. Wilkinson, writes, *inter alia*:—

There was a decrease of 25,048 tons in the tonnage milled and of £27,704 in the total yield; an increase of 10·59d. in the yield and of 1s. 8·23d. in the working costs per ton milled, or a decrease of 9·64d. in the profit per ton milled, and of £22,806 in the total profit, as compared with the previous year. All operations on the mine were adversely affected by the two strikes which occurred in July, 1913, and January, 1914, which subsequently caused such a large decrease in the native labour supply as to hamper mining and development throughout the whole of the year. During the year ending June 30th, 1915, the average number of underground natives employed was 1,872, whilst during the period ending June 30th, 1914, the average number was only 1,442. This shortage of native labour necessitated the use of a larger number of machines for stoping, the percentage of ore broken by machines having increased from 45·8 in 1912-13 to 60·6 in 1913-14. Omitting shaft sinking, station crosscuts, and ore chutes, the footage driven, crosscut, raised and sunk, amounted to 14,428 feet, a decrease of 697 feet. The driving on reef and in country was, however, 1,672 feet less. The development resulted in the exposure of 238,480 tons of an average value of 7·6 dwts. over an estimated stoping width of 48·4 inches. The ore reserves are estimated to be 693,460 tons of an average assay value of 7·34 dwts., an increase of 78,990 tons, the value remaining practically the same as at the close of the previous financial year. Although development in the section near the vertical shaft has been greatly retarded by the scarcity of native labour, crosscutting and driving for a length of 3,267 feet has been completed, of which 1,270 feet is main crosscuts. The Main Reef Leader has been exposed in the drives on the 21st, 22nd, 23rd and 24th levels. In west drives a length of 923 feet was driven, of which 810 feet was sampled, and gave an average assay value of 8·86 dwts. over a stoping width of 48 inches. In east drives 991 feet were driven, of which 505 feet were on reef, and 486 feet in dyke and broken ground. Of the 505 feet sampled, 120 feet on the 24th level gave an average of 5·6 dwts. over 48 inches, and 385 feet on the other levels gave unpayable values. The distance of the vertical shaft from the western boundary is about 3,600 feet, and the results so far obtained indicate the probability that a large percentage of this western area will contain payable ore; while, on the other hand, the outlook for the east side is disappointing. The reef will shortly be cut in the 25th crosscut, and during this financial year the facilities for development will be greater than has been the case for some years. The general outlook for your mine is thus better than it has ever been, and, given favourable conditions as regards labour, the profits for this year should show a distinct improvement.

Inter alia, the General Manager, Mr. J. E. Healey, writes:—The amalgamating plates have been removed from the mill. The tube mill plate house has been enlarged and additional plates installed; all amalgamation is now done in one building, thus ensuring better supervision. The 150-drill turbo compressor, which is in the course of erection, should be available for use by November. The change houses, offices and shops for the vertical shaft have been completed.

Transvaal G.M. Estates.

The following are the particulars of this company's output for the month of September, 1914:—Central Mines: Tons crushed, 12,700, yielding 6,929·342 fine ozs. Elandsdrift Mine: Tons crushed, 635, yielding 721·929 fine ozs. Vaalhoek Mine: Tons crushed, 1,480, yielding 587·133 fine ozs. Estimated value of output, £34,557; estimated profit for the month, £18,514.

Rose Deep.

The quarterly report of the directors of the Rose Deep, Ltd., for the period ended the 30th of June shows the total working expenditure to have been £161,989, or 16s. 9d. per ton milled, and the revenue from gold won £242,740, or £1 5s. 1d. per ton milled. The results of the quarter's work show very little change from those of the previous quarter, except that the average rate of yield has improved by 1s. 2d. per ton. There was a very serious fall-off in the native labour force of 914 boys during the quarter, which is causing a considerable decrease in the current tonnage. The payable tonnage developed for the half-year amounts to 256,359 tons. It is not completely exposed, and there are not sufficient data at present to value it. The sum of £866 was spent on capital account, leaving a balance of £1,470 to be expended on authorised work.

Aurora West.

Mine.—Number of feet driven, sunk and risen, 2,015 feet; footage sampled on reef, 1,395 feet; average stoping width, 42 ins.; average assay value over stoping width:—Payable (855 feet sampled), 8·67 dwts.; low grade (540 feet sampled), 2.80 dwts.; ore mined, 49,081 tons; less waste ore discarded (20.81 per cent.), 10,215 tons; ore sent to mill, 38,866 tons. Mill.—During April 80 stamps ran 17.13 days; during May 80 stamps ran 29.21 days; during June 80 stamps ran 27.89 days. Total running time, 74.23 days. Ore crushed (total tonnage), 38,166 tons; duty per stamp per day, 6.43 tons; yield in fine gold, 7,645.60 ozs.; yield per ton 4.01 dwts. Cyanide works.—Sands and slimes treated (equal to 100.74 per cent. of tonnage crushed), **38,450 tons; yield in fine gold, 3,557·439 ozs.; yield per ton treated,** 1·85 dwts.; yield per ton (on basis of tonnage milled), 1.86 dwts.; working cost per ton treated, 1s. 9.05d. Total yield.—Mill, 7,645.600 ozs. fine gold, 4.01 dwts per ton milled; cyanide, 3,557.439 ozs. fine gold, 1.86 dwts per ton milled. Total, 11,203.039 ozs. fine gold; 5.87 dwts per ton milled. Revenue, £47,619 11s. 2d.; 24s. 11.44d. per ton. Expenditure on capital account.—On account of Permanent works, £1,414 10s. 4d.; machinery and plant, £2,224 4s. 4d.; furniture, £12 5s. Total, £3,650 19s. 8d. The small profit shown for the quarter is due to the loss caused by the suspension of operations for 13 days in April whilst the necessary repairs to the headgear, which was damaged as the result of an accident in the shaft on the 31st March last, were being effected. The average development values, shown above, represent the actual results of sampling, no allowance having been made for any reductions which may subsequently be considered advisable when compiling the ore reserves.

DISAPPOINTING RESULTS AT THE MAIN REEF WEST.

Fall in Yield—Native Labour Shortage Increases Costs—Reduction in Profits Probable.

Year.	Milled.	Yield per ton.	Costs per ton.	Profit per ton.	Total Profit.
1913	231,988	30s. 1·24d.	22s. 3·59d.	7s. 9·65d.	£90,522
1914	212,972	28s. 5·58d.	23s. 1·75d.	5s. 3·83d.	£56,641

THE Main Reef West has had a disappointing year. During the year ended June 30 last 212,972 tons of ore were milled, for a profit of £56,641, as compared with 231,988 tons during 1913, for a profit of £90,522. The working costs showed an increase of 10·16d. per ton, whilst the value of the yield decreased by 1s. 7·66d. per ton. To the working profit of £56,641, above-mentioned, there has to be added the sum of £5,873, making a total profit for the year of £62,514. This amount represents the value of gold obtained during June from the final clean-up of certain plates which will not be required in the new tube mill plate house, to which a portion of the battery plates has been transferred. The payable ore reserves at 30th June, 1914, amounted to 526,440 tons, with an average assay value of 5·7 dwts. over 53·5 inches, showing a decrease of 65,390 tons over the previous year, with a fall in value of 0·32 dwts. The directors' report shows that the balance brought forward from last year was £19,261; profits earned during the year, £62,514; freight rebate on gold shipped, £244; discount on debentures purchased, £4,964; dividends, £451; total, £87,437. Less audit fees for year ended 30th June, 1913, £315; profits tax for year ended 30th June, 1913, £6,707; current shaft sinking, £10,611; provision for redemption of debentures, £25,000; debenture interest, £16,218; debenture expenses, £223; interest and income tax, £231; contribution to Miners' Phthisis Compensation Fund, £4,714; total, £64,022; leaving a balance to be carried forward of £23,414. Capital expenditure amounted to £11,599 8s. 8d.; of this total a sum of £10,611 10s. 7d. has been appropriated out of the year's profits, the remainder being provided from the funds raised by the debenture issue, the balance of cash available from this source at 30th June, 1914, being £4,389 19s. 4d. The directors were able to purchase, at a considerable discount, debentures of a nominal value of £18,740, thus obviating the necessity of the second annual drawing for redemption on the 1st October, 1914. Provision has been made in the appropriation account for the redemption of £25,000 debentures. This sum is represented by the purchase of the £18,740 debentures above-mentioned, together with £10 since bought and £6,250 which formed part of the £25,000 debentures acquired in the previous year, but which were not applicable for that financial year and accordingly did not appear in the appropriation account for 1913. The consulting engineer, Mr. D. Wilkinson, writes, *inter alia*:—

> The decrease in the total profit of £33,881 is due chiefly to a fall in the yield of 1s. 7·66d. and an increase in the working costs of 10·16d. per ton milled. The decrease of 19,016 tons in the tons milled was owing to the shortage of native labour, and was the chief cause of the increase in the working costs. The scarcity of native labour throughout the year, which was a direct result of the strikes of July and January, considerably hampered both mining and development. The average number of underground boys employed during 1912-13 was 1,758, and during 1913-14 was 1,299, necessitating a more extensive use of machine drills for stoping. The percentage of ore stoped by machines during 1912-13 was 48·5, and during 1913-14 was 60·4. Excluding shaft sinking, stations, and ore bins, the feet driven, crosscut, raised, and sunk, was 12,454, as compared with 12,301 feet in the previous year, which, considering the want of native labourers, is satisfactory. The payable reef exposed during development amounted to only 41·8 per cent. of the total, and as a result the payable tonnage added to the ore reserves was 121,110 tons, of an average value of 5·9 dwts. over a stoping width of 49·4 inches. The ore reserves now stand at 526,440 tons, of an average value of 5·7 dwts. over a width of 53·5 inches, thus showing a decrease of 65,390 tons, with a fall of 0·32 dwt. in value.. Owing to the generally disappointing results obtained in the western section, every endeavour has been made to hasten the intersection and development of the reef in the lower levels of this area, with the hope that a better zone might be found in depth. The development in the extreme west on the 10th and 11th levels has continued to expose good values, but the drives on the 12th and 13th levels have shown unsatisfactory values; and this is the most disappointing feature of the year's development. The crosscut on the 15th level from the west shaft is being driven to intersect the reef as rapidly as possible, and at the east shaft the reef will shortly be cut on the 13th and 14th levels. The ore reserves indicate that a smaller yield per ton, and consequently a less profit, must be expected for the present financial year.

MINING MEN AND MATTERS.

Mr. J. Dale Lace has returned to the Rand.

* * * *

Mr. W. Martin Epton is visiting the Rand from Rhodesia.

* * * *

Mr. E. G. Izod, of the Corner House, has returned to the Rand.

* * * *

Mr. A. J. Walton, of the Rose Deep, has returned to the Rand.

Luipaardsvlei Estate.

During the month ended September 30, the above company crushed 18,155 tons, the total profit won being £4,515.

New Kleinfontein.

Appended are particulars relative to the operations on this company's property for the month of September:—Stamps, 200; days run, 28·539; tube mills, 4; tons milled, 51,000; gold recovered, 16,057·763 fine ozs.; net value, £67,292 17s. 9d.; profit, £22,966 19s. 2d.; working costs (excluding development), 16s. 1·389d.; development to working costs, 1s. 3·204d.; total working costs, 17s. 4·593d.; capital expenditure, £584 18s. 7d.; maintenance expenditure upon Apex and Benoni sections, £1,108 12s. 10d.

New Heriot.

The following were the above company's returns for last month's operations:—Tons milled, 13,000; ounces recovered, 5,627; profit, £10,001.

Glynn's Lydenburg.

The following are the particulars of this company's output for the month of September, 1914:—Tons crushed, 4,050, yielding 1,873 fine ozs.; estimated value of month's output, £7,844; estimated profit for the month, £3,951.

Van Ryn Gold Mines.

Report for the quarter ended June 30, 1914. Number of feet driven, sunk and risen, 3,568; footage sampled on reef, 1,681; average stoping width, 42 inches; average assay value over stoping width—payable (1,212 feet sampled), 8·9 dwts.; low grade (469 feet sampled), 2·4 dwts.; ore mined, 128,006 tons; less waste ore discarded (8·78 per cent.). 11,246 tons; ore sent to mill, 116,760 tons. Total yield: Mill, 26,553·199 ozs., equal to 4·56 dwts. per ton milled; cyanide, 10,636·493 ozs., equal to 1·83 dwts. per ton milled; total, 37,189·692 ozs., equal to 6·39 dwts. per ton milled. Working expenditure, £91,480 15s. 10d., equal to 15s. 8·61d. per ton treated; working profit for quarter, £66,818 3s. 3d., equal to 11s. 5·77d. per ton treated; revenue, £158,298 19s. 1d., equal to 27s. 2·38d. per ton treated. No allowance has been made for the Government tax on profits. Capital expenditure, £820 18s. 8d. The working profit shows an increase of £15,819 2s. 2d. as compared with that for the previous quarter; operations during the latter period, however, were adversely affected by the general strike which occurred on the 15th January. The development footage accomplished is 800 feet in excess of the footage driven during the preceding quarter. The average development values, as shown above, represent the actual results of sampling, no allowance having been made for any reductions which may subsequently be considered advisable when compiling the ore reserves.

THE SEPTEMBER OUTPUT: GROUP RETURNS.

Satisfactory Results—Some Breakdowns and Their Effects—The Labour Factor.

Rand Mines Group.

The following are the results of crushing operations of subsidiary companies for the month of September:

Company.	No. of Stamps Running.	Tube Mills.	Tons crushed.	Estimated Working Costs per Ton.	Total Fine Ozs.	Total Estimated Profit.
Rose Deep ...	300	7	57,700	16/ 7·8	16,539	£21,250
Geldenhuis Dp..	300	7	42,100	24/ 2·7	14,204	8,700
Nourse Mines...	260	7	49,000	20/ 4·8	14,975	13,002
Ferreira Deep...	280	7	52,500	18/ 2·2	22,241	45,744
Crown Mines ...	660	26	191,000	15/ 7·5	58,329	96,113
Durban Rd. Dp.	100	3	25,500	23/ 4·7	8,310	5,050
Totals & averages	1900	57	417,800	17/11·9	134,598	£189,859

Geldenhuis Deep, Ltd.—Decrease in profit is entirely due to shortage of native labour, which is now improving.

Nourse Mines, Ltd.—Winding accident during the month caused a decreased tonnage of 4,400 tons.

Ferreira Deep, Ltd.—Accident occurred at No. 1 shaft disorganising work for eight days. This has been put right, but the tonnage for the month shows a decrease of 7,260 tons.

The following are the results of crushing operations of Central Mining companies for the month of September:—

Company.	No. of Stamps Running.	Tube Mills.	Tons crushed.	Estimated Working Costs per Ton.	Total Fine Ozs.	Total Estimated Profit.
Modder B. ...	96	5	36,400	16/ 8·0	15,805	£36,189
New Modder ...	180	7	51,000	14/ 7·8	22,427	56,984
City Deep ...	150	9	43,900	21/ 6·8	20,319	38,102
Village Deep ...	180	7	50,800	17/ 8·6	17,091	26,815
Village M.R. ...	160	4	33,700	16/10·9	15,090	34,939
Robinson	250	6	54,600	14/ 2·5	20,694	48,277
Bantjes Cons....	100	3	21,000	22/ 7·0	6,164	2,199
Totals & averages	1116	41	291,400	17/ 2·8	117,590	£243,505

Albu Group.

The following are the details of results regarding the September operations of the producing mines of the General Mining and Finance Corporation group:—

Company.	Stamps.	Tons Crushed.	Total Cost.
Aurora West	80	14,220	£13,170
Meyer and Charlton ...	75	14,647	12,538
New Goch	120	30,500	20,388
Roodepoort United	75	32,602	25,194
Van Ryn	140	36,650	26,262
West Rand Consolidated ...	100	28,500	26,613
	590	£157,119	£124,165

Company.	Cost per Ton.	Total Revenue.	Profit.
Aurora West	18/ 6·2	£17,786	£4,616
Meyer and Charlton	17/ 1·4	32,675	20,137
New Goch	13/ 4·4	31,325	10,937
Roodepoort United	15/ 5·1	25,499	305
Van Ryn	14/ 3·9	47,889	21,627
West Rand Consolidated ...	18/ 8·1	32,784	6,171
		£187,958	£63,793

Barnato Group.

The results of operations of the Barnato group for August are as follow:—

Mine.	Stamps.	Tons Crushed.	Revenue from Gold.
Consolidated Langlaagte ..	100	50,000	£63,778
Ginsberg	75	14,799	16,557
Glencairn	160	21,110	15,041
New Primrose	155	22,100	24,281
New Rietfontein	60	8,459	7,121
New Unified	60	13,190	13,832
Quest	35	3,792	2,629
Van Ryn Deep	80	42,250	70,121
Witwatersrand .. .	210	40,400	51,728
September totals . .	935	216,100	£265,088
August totals ...	935	226,431	£268,114

Mine.	Total Working Costs.	Working Costs per Ton Milled.	Gross Profit including Sundry Revenue.
Consolidated Langlaagte ..	£35,790	14·316	£28,339
Ginsberg	13,127	17·741	3,561
Glencairn	12,280	11·635	2,977
New Primrose	14,546	13·164	10,043
New Rietfontein	6,961	16·458	360
New Unified	8,715	13·213	5,197
Quest	2,494	13·159	277
Van Ryn Deep	32,198	15·242	38,334
Witwatersrand	27,706	13·716	25,907
September totals ...	£153,817	14·236	£114,995
August totals ...	£155,048	13·694	£117,064

Monthly gross profits: January, £87,277; February, £94,055; March, £104,704; April, £104,493; May, £110,139; June, £115,230; July, £118,604; August, £117,064; September, £114,995.

Consolidated Gold Fields Group.

The following are particulars in regard to the outputs and profits for the month of September of the undermentioned companies of the Consolidated Gold Fields group:—

Company.	No. of Stamps.	Tube Mills.	Tons Crushed.	Gold declared. Fine Ozs.	Total Profit.
Simmer and Jack ..	320	7	67,600	15,974	£26,650
Robinson Deep ...	120	8	49,000	16,787	27,984
Knights Deep ...	400	11	99,520	18,205	17,581
Simmer Deep ...	180	9	53,100	11,213	4,001
Sub Nigel	25	1	4,705	2,254	1,967
Totals	1045	36	273,925	64,433	£78,183

The sundry revenue included in the above total declared profit is as under: Simmer and Jack, £1,800; Robinson Deep, £481; Knights Deep, £192; Simmer Deep, £596; Sub Nigel, £232; total, £3,301.

Reserve gold: Simmer and Jack, 500 ozs.; Robinson Deep, 1,467 ozs.; Simmer Deep, 1,579 ozs.; Sub Nigel, 380 ozs.; total, 3,926 ozs.

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Neumann Group.

The following are particulars of the results achieved by the crushing companies of this group during last month, viz.:—

	TONS.	YIELD.	PROFIT.
Witwatersrand Deep ...	45,220	£56,074	£18,702
Wolhuter	32,900	40,086	12,301
Consolidated Main Reef...	25,070	36,625	11,538
Main Reef West	23,000	24,937	3,075
Knight Central	26,670	28.901	4,383
Total for Group ...		£186,623	£49,999

Goerz Group.

Results of operations of the crushing mines comprising the Goerz group for the month of September, 1914:—

Company	Stamps.	Tube Mills.	Tons Crushed.	Total Value of Output.	Total Profit.
May Consolidated ...	100	—	11,010	£8,986	£419
Princess Estate	60	5	22,200	27,996	2,048
Geduld Proprietary ...	60	5	23,080	38,243	10,204
	220	10	56,290	£75,225	£12,671

Correspondence and Discussion.

Comments on Questions Arising in Technical Practice or Suggested by Articles in the Journal—Views, Suggestions and Experiences of Readers.

The War and—Afterwards!

OPPORTUNITY FOR S.A. INDUSTRIES.

To the Editor, *South African Mining Journal.*

Sir,—The burning question which should be agitating the public mind of not merely Johannesburg, but of all South Africa, even at this present moment, is what can be done to improve the state of local industries and commerce and manufacturers and production in this country. We have the unquestionable fact that, outside the mining industry, we are face to face just now with a depression in trade caused not so much by actual fact, but by apprehension as to the future, as an effect of the war. As to the final issue of the struggle we are not in doubt. "We are fighting now," as the Earl of Roseberry aptly puts it, "with our back to the wall to prevent ignominy and a defeat such as Great Britain has never sustained, and is not now prepared to sustain"; but although we all valiantly proclaim "business as usual," this apprehension is creating a position in which business is not as usual. Therefore, now is the time to prepare to recompense ourselves for these days of suspense by being ready to seize, with both hands, the opportunities which must occur in this country to fill the blanks which the cessation of imports of German and Austrian goods must (fortunately) create. We South Africans must fill those blanks ourselves! They must be filled from within South Africa! And in order that no enterprising foreigners, even other than German and Austrian, may step in and seize upon either our export or import or local industrial markets, now is the time to prepare for the creation of South African national industries, so that, for all future time, this country shall be self-supporting and independent of the paralysing effects of external wars or other events over which we have no control. To-day is the day for preparation for the development of our woollen and other textile industries; of our leather and boot factories; for our fruit-growing orchards, and our fruit-preserving and jam and marmalade factories; for our clothing and blanket factories; for our glass and porcelain factories; for our ironworks and agricultural and other implements; for our paper mills; for our railway material and rolling stock; for facilities for the reduction works of our great mining industry; for our tram cars; for our toys and fancy goods; for our motor-cars and bicycles; and for our own foodstuffs. We must leave no door open for the enterprising outsider, be he German or Austrian or any other foreigner. Not only "British trade within the British Empire," but "South African trade within South Africa," must be our mottoes, and it behoves all moneyed South Africans to-day to step forward to help in the promotion of South African industries of every possible description. In this connection, I am publishing, shortly, a little booklet, showing how suicidal we have been in the past, as regards selling our raw products only to buy them again, in manufactured form, at greatly enhanced prices; and I shall be glad to hear from all interested in this most important subject—which is, to my mind, one on which the whole future prosperity of South Africa depends more than upon any other. It is a lamentable "sign of the times" that, notwithstanding the fact of so many of our young men going to "the front," either oversea or in German South-West Africa, yet employers of either manual labour, or of clerks, or of shop assistants, do not appear to be to any extent incommoded by such an efflux of their employees! At least this appears to be the case, if one may be guided by the dearth of "situations vacant" for men, in the advertisement columns of our newspapers. It is one more significant sign that business is not "as usual" in our midst. And this is also a most significant sign that until South African industries and manufacturers are stimulated and promoted and created, so long will our trade and commerce remain in a state of depression, and so long will poverty be rampant in our midst. South Africa generally, and Johannesburg particularly, must *Wake up*! *Wake up*!! if this is to be a permanently prosperous country. The victories of Peace, to our European industrial population, will prove as vitally important as any victories of War, and if our capitalists are truly patriotic, in the best sense of the word, they will give a hand to-day in the preparation of this great country to become self-supporting—to become a country of Exports instead of Imports.—Yours, etc.,

JAMES CUMMING.

An Example to South Africa.

To the Editor, *South African Mining Journal.*

Sir,—The following conveys an obvious lesson to South Africa:—Daniel Guggenheim returned from Europe in an optimistic frame of mind. In an interview with the *Boston News Bureau*, he said:—"We are in presence of the greatest opportunity in history of this country. It is up to the press and public-spirited men to emphasise this. It is a public duty. Ordinarily, I do not advocate paternalism in the central government, but I believe this the exception that proves the rule. Let every one push and pull to get started. Washington should pass laws, and speedily, to develop our finance and commerce, ship subsidies, special bills, anything necessary to get things going. For the first time the world's marts lie at our feet uncontested. Our European competitors are hopelessly crippled for the time being, and it is up to us to reap the benefits. Let us get ships without delay, start building them, let the Government buy private ocean-going pleasure yachts, any kind of ships that can be used for transportation. Europe wants our products and manufactures, and in a short time will be desperately in need of them. There must be financing and plenty of it, but we can do it. The new currency act gives us power to finance a thousand millions of trade. The machinery to set this country humming is at hand—it only remains to see whether we are energetic and enterprising enough to set it in motion. The outlook? In six months, even less, I expect to see this country fairly boiling with activity. Copper may be a drug on the market now, but its time will come, even before the war abroad ends, for the domestic consumption, I believe, will shortly call for more metal. Right now the two largest consumers of copper in Germany are shut down tight and consequently not taking a pound of copper. The Government should now stop baiting the trusts. I ran out of funds while in England, and could get no accommodation except through cabling home. I received a remittance by return cable with this addition from my son: 'Now you know how it feels to be broke.'"—Yours, etc.,

"AMERICAN READER."

Rhodesian Section.

LATEST MINING NEWS.

The August Output—Rhodesia Chamber of Mines' Report—Claim Licences and the War—East Coast "Tropicals" for Rhodesian Mines.

THE report of the Executive Committee of the Rhodesia Chamber of Mines for the month of August contains the following:—Finance: Receipts during August amounted to £20 12s. 6d.; and payments to £150 5s. 10d. The balance to credit of current account on August 31st was £139 18s. 9d. £300 remain on fixed deposit and £2,000 on loan. Native labour: The following is a summary of the returns of native labourers employed on Southern Rhodesian mines during the months of June and July, 1914:—

	June.	July.
Local	14,747	14,336
Portuguese territory ...	6,816	6,665
N.W. Rhodesia	4,369	3,858
N.E. Rhodesia	5,541	5,858
Nyasaland	7,202	7,160
Other sources	982	930
	39,657	38,807

The number employed in July, 1914, shows an increase of 3,088 as compared with the same month of 1913. Inspection of claims during war period: In reply to representations made to the Secretary for Mines as recorded in the report for last month, your Executive have been informed that the matter has received the consideration of the Administration, and that it is not considered that there is at present any need for general protection. The Mining Commissioners have, however, been instructed not to forfeit any claims on which inspection has been actually delayed on account of the war, but to refer these cases to the Secretary for Mines. Government Notice No. 378 of 1914: Your Committee's attention has been drawn to this notice which purports to give to the Administrator power to limit the hours of employment of natives on mines, to prescribe blasting regulations, hours of shifts, and withdraw all labourers from any mine or impose any conditions as to the employment of natives. Legal opinion is being sought as to the validity of this notice, and in the meantime a protest is being addressed to the Administration against the promulgation of such notices, vitally affecting the working of the mines, without previously submitting them in draft form to the bodies concerned, notwithstanding repeated assurances that such would always be done. General: Amongst other subjects which have engaged the attention of your Committee are: Poisonous fumes from cyanide works, Government Notice No. 248 of 1914, supply of stores in war time, etc. Representation: Mr. C. B. Kingston has been appointed to represent the Rhodesia Gold Mining and Investment Co., Ltd., vice Mr. Francis Drake, resigned. Executive Committee: Mr. Francis Drake having resigned his seat on the Executive Committee on his departure from Bulawayo, Mr. C. B. Kingston has been elected to fill the vacancy thus caused.

Rhodesia, Ltd.

During July, 141 ft. of development were executed at the Sabiwa Mine. Driving from winze 4th level in payable ore. Prospects much improved under intrusion. Winze 1st level averages 15 dwts. During August, 67 ft. of development were executed at the Sabiwa Mine. 5th level drive north from winze under intrusion continues in payable ore. Developments generally favourable. Work much curtailed.

The B.S.A. Company Charter has been extended for ten years.

Crescens (Matabele) Mines.

The company has just sold about 2,750 acres of its main belt block at a satisfactory profit.

Selukwe Columbia.

The total ore reserves to date amount to 20,400 tons, value 11 dwts. The Yankee Doodle Mine being now closed down, such of its plant as could be utilised has been moved to the Wonderland property, and the directors have authorised the erection of a small crushing plant capable of treating approximately 1,250 tons per month, and it is hoped that this will be ready to commence crushing by the end of the year.

Amalgamated Properties of Rhodesia.

Mr. G. R. Bonnard, chairman and managing director of the Amalgamated Properties of Rhodesia (1913), Ltd., and Transvaal and Rhodesian Estates, Ltd., has arrived on a visit to this country. He is accompanied by Mr. H. Ewer Jones, consulting engineer to the companies, whose knowledge of Rhodesian mining will prove useful to the chairman, particularly when examining the Globe and Phoenix Mine, in which the Amalgamated Properties claims a very big interest.

Rhodesia's August Mineral Output.

The output of gold from Southern Rhodesia for August has been declared at 75,998·95 ozs. fine gold, valued at £316,972, being a decrease of 688·53 ozs. in weight and £3,698 in value as compared with July. The output of other metals and minerals was declared as follows:—Silver, 11,785·63 ozs., valued at £1,103; lead, 11·30 tons, valued at £182; copper, 88·50 tons, valued at £4,325; chrome iron, 6,433·28 tons, valued at £14,360; coal, 31,878 tons (sales), £10,483; diamonds, 25·25 carats (sales), £234. The total value of gold and mineral production for the month was thus £347,659, as compared with £338,830 in July.

East Coast Natives for Rhodesian Mines.

The agreement with the Rhodesian authorities for the natives in that territory has been signed and came into operation a few days ago. The recruiting is limited to the district of Tete, in the tropical zone, from which engagement for the Transvaal mines is absolutely prohibited on account of the high mortality to which natives from this origin are subject on the Rand. The new agreement will benefit the Rhodesian mines to a considerable extent, and at the same time it will rectify a position which was of great disadvantage to the Province of Mozambique, inasmuch as natives emigrated clandestinely and, therefore, contrary to what happens in the case of emigration to the Transvaal mines, no benefit accrued therefrom to the Provincial Treasury. Recent statistics show that there are already some 10,000 Portuguese natives on the Rhodesian mines, and it is evident that this Province will in future possess a fine source of revenue in this emigration, whilst the mining interest of Rhodesia, which now have a central organisation on similar lines to the W.N.L.A., will be in a position freely to recruit within the region mentioned. The Portuguese Government has established a curator's office at Salisbury, and provision similar to those in vogue on the Transvaal mines will be observed with regard to the treatment and control of Mozambique natives working in Rhodesia.

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Engineering Notes and News.

An Engineering Opening.

Engineering firms which are on the lookout for new fields to exploit will do well to consider the possibilities of the motor trade. According to the latest available returns of the trade of the United Kingdom with foreign countries, the Germans will stand to lose a much greater volume of trade in this branch than British engineers. Amongst the "parts," special notice may be called to the very large trade, amounting almost to monopoly, which is done in magneto apparatus, now a necessary appendage to most internal combustion engines, but a *sine qua non* for motor car engines of all patterns. The patents held by German subjects, and never revoked under the 1907 Act—as there is abundant reason for believing they might have been—can now be easily "avoided or suspended" under the new Acts, so that there is little or nothing to stand in the way of British makers. We have already heard of one important British firm of electrical engineers which is about to lay itself out for the production of magneto apparatus on a large scale, but the demand will in a very short time probably be large enough to tax the capacities of several such establishments. Beyond the provision of tools of the utmost precision for machining, the effective insulation of the armature windings and the permanence of the field of the magnets, there are no difficulties of importance to be faced in this branch of engineering.

At the request of the Electrical Trade Section the Committee of the Johannesburg Chamber of Commerce has communicated with the Municipalities of Beaufort West and Somerset West in reference to their electric lighting schemes. It is regretted that in each case the conditions of tender were so unsatisfactory that members of the Chamber have found themselves unable to tender.

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SOME 1914 RESULTS:—
MANAGERS - - - January and May - - ALL Passed.
ELEC. ENGINEERS - February - - - - - 66% ,,
MECH. ENGINEERS - June (Kimberley Centre) - - ALL ,,
MINE OVERSEERS - - - - - - Practically ALL ,,
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The Board of Trade and German Capital.

In response to recent inquiries in London, Mr. Runciman, President of the Board of Trade, has stated that he hopes very shortly to make an announcement on the subject of trading with British firms operating in England whose capital is owned, either in part or entirely, by German subjects. In view of the foregoing statement the following letter is of interest:—

Dear Sir,

State of War.

The resolutions, of which a copy is handed to you herewith, were passed at a Council meeting here last afternoon, and I am to request you to inform me on or before 9th inst. whether you assent to them.

(Signed) D. N. DUNLOP,
Secretary, British Electrical and Allied
Manufacturers' Association.

London, September 5th, 1914.

1. Resolved, that having regard to the state of war, it is the opinion of this Council that trading with (1) Any company incorporated in Great Britain the controlling interest in the share capital of which is held by Germans or Austrians; (2) any German or Austrian firm or branch or agency of German or Austrian firm trading here, whether in the same or in another name, is against the best interests of the British electrical and allied industries.

2. Resolved that the secretary be, and he is hereby instructed, to invite members of the Association who fall under definition (1) or (2) in the first resolution to resign their membership.

3. Resolved that members of the Association be instructed that in the opinion of this Council it is against national interests for them to buy from or sell to firms falling under definitions (1) or (2) in the first resolution

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THE VENTILATION OF MINES ON THE RAND.*

Importance of System—A Plea for More Study—Special Committee Suggested.

In replying to the discussion on the paper "Ventilation of Mines," contributed by me last November, I confess I am extremely disappointed that the discussion was not of that nature as was to be expected from an Institution with such a large number of mining men for its members. The importance of systematic ventilation seems to be grasped only by the few, and so little attention has been devoted to the subject that to-day on some of our largest and deepest mines the ventilation question is ridiculed, and the miners and underground officials truthfully say that in many cases there is no ventilation at all. This is a scathing indictment on those responsible, for with ordinary careful study and application any mine, however difficult, can be properly ventilated. The ventilation of mines has an important economic aspect, since it affects to a large extent the industrial efficiency of the workmen, and consequently the cost of mineral production. Until recently the ventilation of metalliferous mines has not generally received much attention, and the importance of pure air has been sometimes overlooked. To the absence of explosive gases in such mines and to the cost of the installation and working of mechanical ventilators may generally be attributed disregard to adequate ventilation. The most recent prosecutions for contravening the regulations in this respect have revealed the grossest incompetence and neglect on the part of those responsible, and until the Government enforces to the fullest extent the systematic and proper ventilation of metalliferous mines the same slip-shod methods will obtain, and the low degree of efficiency at present existing amongst all our underground employees will remain where it is. In striking contrast to the inattention given to the underground conditions prevailing, it will be remembered that some few months ago we had a most excellent report presented to us by Surgeon-General Gorgas, of Panama fame, on health conditions, sanitation, housing, etc., on the mines, and while that gentleman dealt in an admirable and exhaustive manner with his subject, and recommended important changes in order to reduce the high percentage of pneumonia cases prevalent, he dealt entirely with surface conditions. In a few brief remarks on miners' phthisis he recommended the continuation and enforcement of spraying underground, and concluded by advising that fresh air should be supplied. I venture to assert again that the ventilation problem is the most vital and important subject we have to face and deal with to-day in the whole of our gold mining industry. Vital and important because it bears directly on the phthisis evil and on the efficiency of all our underground workers. Cases of pneumonia are contracted by those working in hot and badly ventilated mines when coming off shift into a much colder atmosphere on the surface. The "Safety First" campaign which has been organised, and of which so much has been talked about is really only a caution or warning to mine operatives as long as the notice-boards are before them. Since its introduction the percentage of accidents (which is all it embraces) has not been appreciably minimised. It pales into insignificance as to its utility when compared with the saving of human lives, a thing which must result from proper and systematic ventilation. Warnings also apply to the use of sprays, respirators, etc., but everything depends upon the men themselves. The miner's own watchfulness is his safeguard, as far as it lays in his power; but with ventilation he has to put up with what is provided. Colonel Gorgas's report and recommendations practically agreed with that of our local medical men, and no new ground had been broken of any consequence. Soon after this I approached the Chamber of Mines, and suggested that to continue the good work begun they should invite Dr. J. Scott Haldane (the foremost British authority on underground atmospheres) to do the same for the industry underground as Colonel Gorgas had done for the surface. The last word would then have been said on underground conditions, and the whole of the mining community would be satisfied that the highest authorities had given this subject their earnest and valuable attention. In this matter the Government might also co-operate.

In reply to Mr. Calder: The use of steel supports in mines in place of timber is no new idea, and the practice is gaining ground in mining operations rapidly. They are extensively used in Great Britain and on the Continent, and even more so in America, with excellent results. I do not contend, however, that their adoption should be general throughout a mine. In the main roadways of some of our mines on the Rand, where, owing to roof pressure, an enormous amount of large timber is used, the use of steel setts would be cheaper. A letter number would be required; they would last longer, take up less space, and render conditions healthier, since there would be no putrefaction of timber as at present, and ventilation would not be retarded. The ventilation by steam was not recommended by me for use in deep mines, but was given as an instance of what has been done, and to what extent it could be utilised in sinking and developing prior to the installation of a fan.

In reply to Mr. Austin: Mr. Austin seems to take exception to my not having introduced any formulæ in the paper. I purposely avoided this, because so very few formulæ are required to carry out an elaborate system of ventilation in a practical form. The necessary formulæ are easily remembered by the mining engineer when planning his system. The Atkinsonian experiments and formulæ arrived at from 1854-1863 are too well known to be mentioned, and are constantly referred to by every mining man. In Mr. Atkinson's papers laying down the scientific basis of mine ventilation he confines himself to very few formulæ. While we have sixty years of practical precedent to work upon, we are told to-day on the Witwatersrand that experiments are still going on, especially with fans, underground. These underground fans commonly known as "dust-disturbers," are in most cases wastefully employed and are wholly inefficient. Not long ago on one mine a large fan was to be installed at the surface. All preparations for the same were in progress, when, at the eleventh hour, it was cancelled and ordered to be put underground. This mine at the present time is one of the worst ventilated along the Reef, and so bad that Government Inspectors have threatened to close it down unless the conditions are altered. A recent terrible explosion in a coal mine in Great Britain, resulting in great loss of life, was directly attributed to tampering with the fan, and emulating Rand methods by placing it underground. We are not progressing with these so-called experiments, but, on the contrary, we are going backwards.

In reply to Mr. Getz: No reliance whatever can be placed upon the readings of anemometers in irregular-shaped drives. This would, of course, mean that the perimeter would be very irregular also, therefore only an approximation could be arrived at. As an example: In a smooth-lined fan drift readings have to be taken at different points of the cross-section, and an average taken of the whole of the readings. The reason for making upcast shafts circular in shape and smoothlined is to reduce the friction of the air. Contrast this with a fan discharging into the bottom of an old disused shaft, with an uneven perimeter, and you descend from the sublime to the ridiculous.

In reply to Mr. Vaughan: Mr. Vaughan, and also Mr. Laschinger, had looked forward to more details, and also a general comprehensive scheme of ventilation, suitable, as it were, to all mines. I pointed out in the paper (p. 99 of the "Journal") that this is impossible. There will be different systems and variations of the same system to suit varied conditions. It is difficult to explain ventilation schemes

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*Author's reply to discussion of paper by W. Pile, read before the South African Institution of Engineers.

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by word of mouth, as so many factors have to be taken into consideration, such as the size of the mine, the number of sections and consequent number of splits, the dip of the strata, number of levels, position of winzes, etc. These all tend to make ventilation a matter of variation. The addition of small fans underground as "helpers up," connected by light tubing to the faces, stopping, doors, regulators, air-crossings, etc., go to make up an efficient system of ventilation. I still, however, strictly adhere to the fan for main ventilation being installed at the surface. In the collieries of Great Britain blowers were unknown. Separate and adequately proportioned intake and return air-courses enabled exhaust fans to be worked against a low water-gauge with high efficiency; thereby larger volumes of air were circulated at lower velocity than any blower was capble of doing. I cast no reflection on mine foremen, as Mr. Vaughan suggests, but while I agree with him that ventilation should be a most essential part of the examination, I can assure him there are several instances of candidates who recently passed their examination, and ventilation was neither a subject nor was it touched upon in any of the questions. On the day after my paper was read four lives were lost on a large mine by "gassing." The gassing of these men occurred 21 hours after blasting had been carried out. Does this suggest practical ventilation, or was the ventilation still in its experimental stage? Mr. Laschinger told us about experimenting with two upcast shafts and one downcast shaft, and *vice versa*. Was it not possible for the system of the ventilation of the mine to have been thought out before the position of the shafts were located and development so far advanced? Two adjacent mines on the Reef, one an outcrop and the other a deep level, are connected, and a large fan placed underground midway between the two mines is in operation. The outcrop mine is getting all the foul and vitiated air discharged from the deep level. There is no need for this because there are shafts on the outcrop property which could provide for a separate installation of its own. Can this be called proper ventilation?

In reply to Mr. Veasey: Practice with jet ventilation is opposed to theory in this matter. When steam was sent to the bottom of a shaft it lost a good deal of its initial pressure, this loss being represented by the amount of condensation in the pipes. The steam discharged in the shaft was aqueous, and on coming into contact with the walls of the shaft (especially a wet one) further condensation took place, thus the useful effect was lost. In addition, leakage always took place between the upcast and the downcast compartments. When the jet was placed near the surface this condensation was avoided, drier and more effective steam could be used, and the prime object—that of creating a partial vacuum—was better accomplished. Seventy feet below the surface was a useful distance to place the jet, because neither the surface nor mine conditions interfered with its duty. Experiments on another mine, less than 500 feet deep, with a smooth circular shaft as an upcast, and the steam jet at the bottom of the shaft, produced disappointing results, and when the jet was placed near the surface the efficiency was 50 per cent. greater. In referring to Bendigo practice, the shafts were nearly all of a rectangular shape, varying in dimensions, many of them being 14 feet by 9 feet. The regulations of 1907 enforced the ventilating compartment to be of an area of not less than ten square feet. This was the minimum, and applied to shafts much smaller than the above dimensions. A large amount of sorting was done in the Bendigo mines, the tubs were small, and the quantity of rock hoisted was trifling compared to Rand haulage, and in many cases two compartments were bratticed off as an upcast. The "saddle-backs" or reefs were worked in an entirely different manner to our immense conglomerate beds. The shafts could not be called single-outlet mines, as eleven almost parallel lines of reef were being worked, and a more perfect system of connecting up the lower to the higher levels could not be conceived; consequently the formula again quoted did not apply. I quote a further extract from the Victoria Mines Act:—

DRIVES CONNECTING MINES.

"All drives by which any two or more mines are connected shall, if considered necessary by an inspector of mines, be kept open for ventilation and escape; but the chief mining inspector may order any connection between mines to be closed where he considers the ventilation conditions will be thereby improved. Upon the order of an inspector of mines, made with the concurrence in writing of the chief mining inspector, owners shall construct such connecting drives where the works are not more than 300 feet apart, for ventilation and escape, at their joint expense; and where deemed necessary for the purpose of ventilation by an inspector of mines all levels shall be connected by winzes, upon the order of such inspector made with the concurrence in writing of the chief mining inspector." In conclusion, I have to thank those members who took part in the discussion, but at the same time do not feel at all satisfied that the subject, in common with many others, has received the attention it deserves, and I suggest that a committee be formed to investigate the whole ventilation question, on which so much depends.

New Patents.

323. Henry Rawes Whittell.—Improvements in and relating to earth excavating machines.
324. Sidney George Moore.—Improvements in golf clubs.
325. Charles Jack David Symons.—Improvements in electric fuse holders.
326. Kenneth Somerset Bell and George Gilbert Carter.—An improved shovel for manual use.
327. Sydney Edward Thacker Ewing.—Improvements in jockeys or rope grips for use in mechanical haulages and the like.
328. Walter James Creeser.—An improved valve motion for steam locomotives, reciprocating steam engines and the like.
329. Jean Harle.—Detonating fuse.
330. The Shefks (South Africa) Ball-bearing Company, Ltd., and Percy Atkinson.—Improvements in and relating to rope idlers and the like.
331. Ludwig Knipp.—Rail fastener.
332. Joseph Gouldie.—Improvements in either side brakes, combining hand lever action with continuous brake mechanism for railway wagons and other vehicles.
333. James Edward Chard.—An improvement in spray nozzles.
334. Eduard Ruegger.—Improvements in ice-making machines
335. William Charles Stephens.—Improvements in or connected with rock drilling machines.
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Safety-First Rules for the Electrician.

At the recent convention of the South Western Electrical and Gas Association at Galveston, Texas, F. N. Lawton, manager, Wichita Falls Electric Company, stated that this company had prepared the following rules for men engaged in electrical work:—

SWITCHBOARD INSTRUCTIONS.

Safety First.—Remember your family and protect your fellow workmen.

When operating the switchboard always stand on the rubber mat.

When throwing the switches, use but one hand.

When necessary, use rubber gloves, hanging upon the board.

Keep the board well lighted. Have oil lanterns always ready.

In case of fire open your exciter switches first, then use sand.

Report the slightest signs of trouble on the board.

Keep instruments and wiring all clean.

Use danger card when circuit is off for repairs or trouble.

Report all trouble on station log.

Watch temperature of oil in constant current regulator.

When working on back of board use wooden stool and rubber gloves.

LINEMAN INSTRUCTIONS.

Safety First.—Remember your family and protect your fellow workmen.

Learn the position of all circuits and wires upon the poles.

Use your rubber gloves in handling all wires. They may be alive.

Take the safest position on the pole.

Keep yourself free from grounds. Watch out for telephone cables and messenger wires.

In coming down a pole, watch out for street signs fastened to the pole.

In using tools on a pole, keep the groundmen away from the pole.

In making wire connections, use but one hand at a time. Don't get in circuit.

Constantly inspect lines for trouble. Keep all primaries clear.

Put away all tools at the end of the shift.

Keep your spurs, body-belt and all tools in good condition.—*Elec. Review and W. Electn.*

Union Steel.

An extra-ordinary general meeting of the Union Steel Corporation (of South Africa) was held on 23rd September to consider resolutions passed on 7th September, under which 100,000 of the unissued preferred ordinary shares are to be converted into preference shares, entitled to a cumulative dividend of 8 per cent. per annum and to 75 per cent. of the remaining profits. The preference shares are to be offered to shareholders and are to be payable 2s. 6d. per share on application, 5s. on allotment and the balance in calls of not exceeding 2s. 6d. each at intervals of not less than two months between each call. No allotment will be made unless at least 40,000 shares be applied for.

Very many members of the engineering profession in the United Kingdom having expressed the wish to be allowed to serve their country together in one regiment or battalion, the Institutions of Civil, Electrical, and Mechanical Engineers have under consideration the formation and training of a battalion enlisted from among their members with a view to its forming part of Lord Kitchener's Army.

German Trade in Pumps and Pumping Machinery.

The export trades of Germany, Austria-Hungary and the United Kingdom in pumps and pumping machinery are dealt with in a pamphlet just issued by the Commercial Intelligence Branch of the Board of Trade. It may be said at once that the Austrian trade is negligible, and that the German trade is nearly as great as that of Great Britain. Those who desire the actual statistics may consult the original. We will here divide the markets into three classes as follows:—(1) Markets in which German trade preponderates: Norway, France, Italy, Roumania, Russia, Dutch East Indies, Brazil, Cuba, Mexico, Canada. (2) Markets in which British trade preponderates: British South Africa, Egypt, Japan, Argentina, Chile, Spain. (3) Market in which trades are about equal: Turkey. It appears, then, that the principal interests of the two countries lie in different markets. Altogether the trade in pumps, etc., of Germany and Austria in colonial and neutral markets is valued at £446,870 per annum, to which must be added £32,040, the value of their exports to Great Britain. We thus get a total of £478,910 as the value of the trade that "might conceivably be secured by British makers." The returns are exclusive of pumps in combination with internal combustion motors. These have already been dealt with in a previously published pamphlet summarised in our last issue. The report then proceeds to outline the conditions prevailing in certain specified markets. The following remarks are extracted from the information given:—South Africa: The United Kingdom has well over half the trade in pumps, the United States about a quarter and Germany about an eighth. Steam engine driven centrifugal pumping plants of 4 to 18 horse-power, and mostly designed with wood-burning boilers, are much in use in the Cape Province, and are all of British manufacture. Suction gas pumping plants are used in large numbers, and a market is opening up in the Free State Province for them in connection with farm irrigation work. At present charcoal is the common fuel, but as this is getting scarce colonial anthracite containing a large percentage of sulphur, and therefore forming clinker very readily, will have to be used. The suction gas plants are nearly all British. In the Transvaal mines many multi-stage high-lift electrically driven centrifugal pumps are in use, and are nearly all of continental origin. The centrifugal pumps used at extractor houses, cyanide plants and such like are usually of American manufacture.

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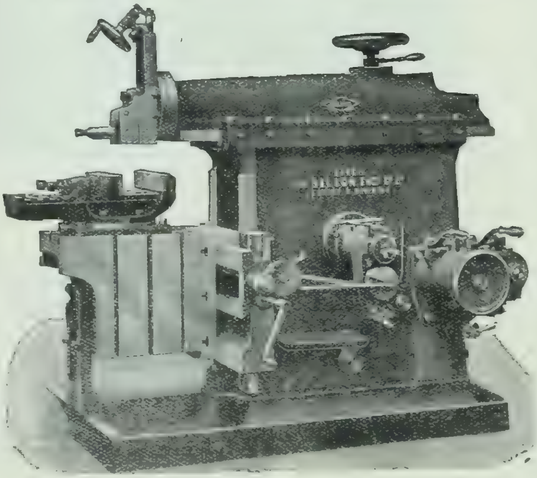

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Finance, Commerce, and Industries.

The War and the Building Trade.

So far South Africa seems to be the only part of British possessions where the building trade has been adversely affected by the war, says the *Builders' Journal*. On the outbreak of hostilities the Public Works Department of the Union to all intent and purpose ceased to exist, and the result of this can well be imagined when there is taken into consideration the big percentage of building contracts in the Union that are annually let out for public contract by this particular Department. "Business as usual" received a sudden shock. It is hoped the cessation is only temporary.

* * * *

Rand Agricultural Show.

There has been an idea in some quarters that the Witwatersrand Show for next year was to be abandoned or reduced in size. On the contrary, it is the intention of those in charge to have a better show than ever, as they consider that the conditions are particularly favourable to agriculture and stock-raising, and that the country ought to take full advantage of them. The secretary states that a number of extensions are to be made, including the duration of the show, which will last over six days, commencing on April 5th. The Africander championship will be embodied in the show, and, in view of the importance of building up an export meat trade, the prizes for slaughter stock will be increased from £100 to £500, special attention to be paid to prime young stock as distinct from the "passe" trek ox. A number of improvements to the ground will be undertaken, the Central Mining group having given £2,000 for new buildings, and Mr. Jan Meyer £500 for a ladies' tea-booth—the latter in recognition of the good work always done for the show by the ladies.

* * * *

Military Needs and Galvanised Iron: Drastic Step.

The galvanised iron trade in the United Kingdom, which has already received much attention at the hands of the Government in respect of spelter supplies, has been the subject of another drastic step on the part of the military authorities. It will be remembered that a few weeks ago the authorities commandeered all the stores of spelter on railway and canal wharves in Birmingham. Now they have gone further. Fearing that there might not be sufficient spelter left in the country to execute the heavy orders for galvanised iron which it is understood is their intention to place for the erection of buildings in connection with winter quarters for the troops and for other purposes, they have issued a *Gazette* announcement prohibiting the exportation of any description of galvanised sheets. This decision has taken the trade completely by surprise, and will have far-reaching effects. Of all branches of the iron trade the galvanised sheet business is most dependent upon the export trade for support. Colonial and foreign orders are the very existence of the industry.

* * * *

The Trade War.

At a meeting of the Pretoria Chamber of Commerce, held last week, it was reported, *inter alia*, that considerable publicity had been given to a circular letter addressed to all Chambers of Commerce affiliated with the Associated Chambers of Commerce of South Africa, by H.M. Trade Commission acting under authority of H.M. Board of Trade, appealing to merchants and distributors, who are regarded as the most powerful force available in educating consumers as to the merits of an article, and in creating a demand, to support the principle involved within the phrase "Trade within the Empire." After full consideration of this matter the Executive resolved to submit the following resolution for acceptance of members to be forwarded to H.M. Trade Commissioner in Capetown, for transmission to H.M. Board of Trade in London:—Recognising the benefits which are derived by Great Britain and her Dominions beyond the seas by retaining "Trade within the Empire," this Chamber resolves to confirm its acceptance of and sympathy with the proposals advocated in support of this principle, in the Circular Letter addressed to Chambers of Commerce in South Africa by His Majesty's Trade Commissioner for South Africa, dated 22nd August, 1914, and desires its members to do all they can to assist the object in view by adopting the following or any other means which may be within their power, viz: (a) Purchasing British made goods in preference to those of foreign manufacture. (b) Strenuously endeavour to create a taste for British made goods among customers where a preference has been shown for foreign manufactures. (c) Make use to the greatest possible extent of the machinery of the British Board of Trade for promoting British trade interests in South African markets. The Secretary said there was a suggestion from the Executive Committee that a special tax be put on German imports into British Dominions. The report of the Executive was agreed to.

German-made Pipes.

At the last meeting of the Belgravia Ratepayers' Association, the secretary stated that he had read in one of the local newspapers a report of a meeting of the Parktown North Ratepayers Association, from which it appeared that because the Town Council wished to use pipes of German manufacture for water purposes, instead of pipes of British manufacture, that body did not want to have anything to do with it. In that connection, he begged to move: "That a letter be written to the Town Clerk, asking if it is a fact that the Finance Committee of the Town Council sent a suggestion to the Works Committee to accept a tender for water-pipes of German make, because that tender was the lowest, in preference to water-pipes of British manufacture, which certainly were more expensive but of superior manufacture, and if this action complies with the King's proclamation re trading with the enemy." Mr. Anderson explained that the point was this. The Parktown people came to hear that it was intended to articulate their district with German made pipes, and they were required to pay a special assessment for the work; rather than agree to this they would not have anything to do with it. Mr. Bloom argued that it would be penalising the British merchant, who bought these pipes before the outbreak of the war. He thought the matter should be left alone. Most of the members expressed similar views, and asked the proposer to withdraw. The secretary said that he would be compelled to do so, seeing that his proposition had not been seconded. However, he had been rewarded by the lively discussion that had emanated from his proposal.

* * * *

The War and Meat Supplies.

Plainly, there will be a shortage of livestock in Europe. Before the war Germany possessed 20,630,000 head of cattle, 22 million pigs and about eight million sheep. In England one-third of the cattle, sheep, and pigs stood for seven months' supply without importing, and we may assume that one-third of the livestock of Germany would represent three months' supply, since the population is larger. One ox is reckoned to supply food for 40 men, and Germany's 20½ million head of cattle would feed 824 million men one meal, or six million men for 137 days. We see then that the number of livestock would be enormously reduced to feed the army and the people. There will, as one result of the war, be a great European demand when peace is restored for thoroughbred cattle; there will also be a bigger demand than heretofore for mutton and for wool. Writing from this standpoint we are face to face with the exhaustion of the nations and the effect on trade, and we may urge here that history proves that wars are followed by immense trade activities. Japan was exhausted by war, but she used the wonderful organisation she had built up to fight Russia in order to make trade. Russia passed from the great struggle through a period of internal political dissension, but nevertheless developed trade. France recovered from the 1871 campaign at a bound, and we are sure, therefore, that even this war of the nations will not leave Europe in ruins, but will inspire Europe to renewed trade activties. For South Africa there will be promise of a great revival.

* * * *

The United States and German Shipping.

A large number of the great vessels of the German Hamburg-Amerika and Norddeutscher Lloyd lines are now lying idle in the eastern ports of the United States. The expense to the German shipping companies is considerable, since each vessel has to pay continuous harbour dues and the wages, or at least a portion of the wages, of the crews; and their inactivity is an eloquent commentary on the actuality of British sea power. A scheme has been put forward, probably from German sources, suggesting that the United States should purchase these vessels and run them under the Star and Stripes as neutral ships; a plan which would both cut the losses of the German shipping companies and assist materially in financing Germany during the war. The plan has been carefully examined in the United States, and at first it appealed with considerable force, since it offered the States an opportunity of restoring her mercantile marine, which has never recovered from the Civil War, at presumably a very low rate—since the Germans would surely be glad enough to be rid of their present encumbrances in America on easy terms. But the more the scheme was examined the less it was liked. It would have been a departure from the strict neutrality which the President has laid down as the United States policy during the war; and although the President himself appears to favour the purchase, public opinion is certainly chilly, if not actually hostile. If the ships were used to convey food to Germany, Britain would object; if used to convey food to Britain, Germany would object; and the United States are faced with the possibility that the Allies might not recognise the sale of the vessels, and any attempt to use them in war time might instantly land the United States in serious diplomatic complications—a fact of which Germany was presumably well aware when she first suggested the purchase of these ships by the Government at Washington.

London Stock Exchange.

According to Reuter, the London Stock Exchange Committee have suspended the ordinary process regarding failures, and the Committee may, on application, arrange the gradual official liquidation of a member's affairs, such member being only suspended. The papers agree that this is insufficient, and deprecate any premature re-opening of the Stock Exchange. The *Observer* says the position on the Stock Exchange is being cleared up. Commitments have been reduced, and moderate investment business is being done, especially in companies benefiting from the war. Rand mining shares are attracting a fair number of genuine buyers.

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THE SOUTH AFRICAN MARKET FOR ELECTRICAL APPLIANCES AND APPARATUS.*

Valuable Facts for British and Other Manufacturers Seeking to Capture Lost German Export Trade.

SOUTH AFRICAN TRADE.

German electric firms have been particularly active in South Africa during the last few years. The electrification of the Rand has led to large importations of electrical machinery and appliances, which for the most part have been obtained in Germany, and the adoption of water-power for this scheme has considerably developed the use of electrical power in other directions. The efficient organisation of German firms in the market has secured for them a large share of the general trade, a regular supply of material from German sources having up to the present been assured by the fact that original plant installations were largely of German origin, while in many cases German engineers have been in charge of large centrals. Dealing with this subject in his last annual report recently received, H.M. Trade Commissioner gives the following table of imports of electrical goods, showing what an immense demand for this line existed in South Africa during recent years:—1908, £478.359; 1909, £631,865; 1910, £1,428,888; 1911, £1,030,627; 1912, £917,186; 1913, £983,624. Of the total value of the above imports for the last six years, Germany enjoyed no less than 44·9 per cent. of the trade. The Commissioner adds that latterly trouble with some of the foreign-made plant has occurred to an alarming extent, and that the faults are due not only to an over-rating by the makers of the capacities of the various machines, but, in some cases, to bad design and manufacture. H.M. Trade Commissioner recently prepared a special report on the subject of electrical machinery on the Rand. He thinks the reason why foreign manufacturers have been more successful than British firms in the trade in electrical machinery and accessories is not far to seek. The former, as a rule, carry good stocks, and mines are consequently not kept waiting for deliveries. Moreover, they employ as local managers and engineers men thoroughly equipped both with commercial and technical experience, the result being that their representatives are able to place full details of their offers before buyers, without reference to their principals oversea. If it could be said that the material supplied by foreign firms was bad, this would account for lower prices consistently quoted. But, except in a few specific cases, the plant is good, and is said to be equal in quality to that of British make, although perhaps lighter in non-essential parts. This ability to underquote must be due to the reduction of work costs, effected by an increased output, or to better shop organisation. The majority of mines have now placed all their large orders, therefore the extensions of existing plants, or the opening up of new mines, will afford the only opportunities to manufacturers of heavy machinery to quote for some time to come. It must be remembered, moreover, that the mining authorities will be disposed, if their previous plants have worked satisfactorily, to place orders for such extensions with the makers of the original plants. It is most unfortunate that British firms neglected the great opportunities which this market afforded until the majority of the large orders had passed into foreign hands. The Commissioner is informed that in some cases machines of too small capacity have been installed with dissatisfaction to users, but the principal fault with electric motors and switchgear is non-attention to small details in the manufacture of terminals, bearings, lubricating apparatus or brush gear. Many examples have been brought to light of motors having been designed by people who could not have had much experience of the actual operation of such plant under continuous heavy-load conditions. With regard to switchgear, it is stated that makers frequently rate their switches too high, or design them merely to take the ordinary full load of the motor. Under normal conditions, switches and circuit-breakers do not have to carry more than this normal current, but on overloads of short circuits they have to carry very much heavier currents, and frequently destroy themselves in so doing. Another point is that, in switchgear for small currents mechanical strength is neglected, and the current carrying capacity is the only consideration. It is obvious that whatever current a switch has to carry, it must be sufficiently strong mechanically to take the roughest handling of unskilled men. In large power stations for municipalities and mines the type of "prime mover" generally gaining ground is the steam turbine, directly coupled to a polyphase generator. For smaller plants, the vertical high-speed steam engine, directly coupled to a three-phase generator, or, in some cases, to a continuous current generator, is generally adopted. There is no doubt that three-phase electrical plant is the class almost universally used for mining purposes. There will be a continued demand, but in a smaller degree than in past years, for the following:—

(1) *Three-phase Motors, Generators, and Accessories*, for surface and underground requirements. "Competition by German and American firms is so keen in this market that the British manufacturer has not obtained his proper share of the trade. Plants of this description are at present supplied approximately in the following proportions: Germany 70 per cent., United Kingdom 20 per cent., and United States 10 per cent. British firms now appear to be competing more successfully than before. Bare copper conductors and insulated cables are largely supplied by British makers, probably 75 per cent. of the total. The supply of lamps is practically all in the hands of German manufacturers."

(2) *Electric Winding Engines* for surface use and underground for multi stage haulage. "Electric winders are rapidly coming into general use, but this system has not yet entirely superseded steam winding. In about 80 per cent. of plants already erected, the electrical portion of the work is of German manufacture, the remainder being of British make. As regards the supply of the mechanical portion of the hoists (drums, indicator guards, etc.), the reverse is the case, about 70 per cent. being British and 30 per cent. foreign. It may be generally stated that British winders are of heavier and stouter build than those of foreign make, and that British electrical gear is giving greater satisfaction than German. The contracts made by the Eckstein-Rand Mines group with the Rand Mines Power Supply Company necessitated the electrification of the whole of the winding plant, and practically every one of the winders is now equipped with its electrical gear. Owing, however, to the difficulty of obtaining the requisite power from the supply companies, many of these winders are still steam-driven, and will not be converted into electric-driven machines for many months to come.

(3) *Electrically-driven Pumps* for underground use and for pumping against considerable heads. "There is a steady increase in the demand for high-lift pumps. Multi-stage centrifugal pumps have been adopted by a number of mines, and Continental makers have secured almost all the orders placed by mines for this type. For surface work, centrifugal pumps (of non-multi-stage type) practically monopolise the market, and are at present mostly of British manufacture. Competition in centrifugal pumps generally is severe. Reciprocating pumps, for underground work, are about equally divided between America and Great Britain, though a few orders go to the Continent."

(4) *Electrically-driven Air Compressors.*—It is sometimes proposed to adapt these for erection underground, in order to bring them nearer the rock drills, which they are principally required to operate. "Existing plant is divided amongst British, German and American manufacturers, in the proportions of about 30 per cent., 60 per cent., and 10 per cent. respectively. America's share is mostly made up of small varieties of work. Compressors made by German firms have a great vogue in South Africa, as the makers' attention to detail is said to be productive of economy and efficiency. Practically all compressors are electrically driven, and the speed being thus more or less constant, efficient devices to meet changes of load are of the greatest importance. In the 'piston' type of compressor, attention to valve-design has brought the Germans to the front, and British firms who have secured orders are said to be licensees of German patents. Small rotary (turbine) compressors are not yet firmly established, but the Rand Mines Power Supply Company's air compressor stations are equipped, through the Victoria Falls Power Company, with large Continental compressors of this type. Orders for low pressure compressors have been placed with British firms, but their value and number is comparatively trifling."

(5) *An Electric Rock Drill* of absolutely reliable and simple construction would be greatly appreciated, but nothing of this type has yet proved practical.

Electric Haulage.—Before passing from the electrical section to mining plant, it might be well to refer to the subject of electric haulage.

"*Surface Railways.*—Electric locomotives of high tractive power are being abandoned, as the working cost of this form of traction is said to be prohibitive. In all instances, these electric locomotives are of German manufacture. Electric locomotives for surface work are being replaced by steam locomotives. Mines' requirements in the matter of steam locomotives are met to a considerable extent by the purchase of engines abandoned by the South African Railway Administration, on account of the loads now hauled on their lines being beyond the capacity of these engines. New steam locomotives required are invariably of British manufacture.

"*Underground Railways.*—For the few underground railroads projected, electric traction is being installed. The locomotives will be comparatively small, and in all probability of German or American origin.

"*Rails.* Regarding heavy section rails, generally used for surface and shaft track, about 60 per cent. are German, but lately American makers have been doing an increasing amount of business. During the last year this must have amounted to 40 per cent. of the total. British trade in this matter cannot be regarded as satisfactory.

"*Cars.*—Large capacity ore cars were, until lately, all of German make, but now British makers are getting a very good share of the business at lower prices than German makers are willing to accept."

Speaking in London in mail week, Mr. E. G. Seltridge said:—For manufacturers and others to withdraw from publicity in the shape of advertising at this moment seemed almost as unwise as for a battleship to withdraw its fires when it was being attacked by the enemy. Instead of withdrawing the fires they should make them still hotter. Publicity, advertising, was to business what the fire is under the boiler. It produced the steam and drove the machinery of trade and commerce, activity of which was necessary for the Empire's prosperity.

British versus German Trade.

A pamphlet issued by the Board of Trade deals with the iron and steel tubes, pipes, and fittings exported to all destinations from Germany in 1912, from Austria-Hungary in 1913, and from the United Kingdom in 1913. The values were respectively as follows:—Germany, £4,383,000; Austria-Hungary, £12,840; and the United Kingdom, £4,661,000. Owing to the entire absence in the United Kingdom returns of any particulars as to thickness, method of production, or finish, it is only possible to compare British and German exports of tubes and pipes in the aggregate. The following statement shows for a recent year the value of all kinds exported from Germany and the United Kingdom to the principal colonial and neutral markets to which Germany sends such goods:—

Countries to which exported.	From Germany (1912). £	From United Kingdom (1913). £
British South Africa	91,400	359,300
Straits Settlements	13,000	184,400
Australia	63,700	539,000
Canada	67,500	209,100
Norway	78,200	97,400
Sweden	68,400	90,700
Denmark	193 500	65,700
Netherlands	440,900	59,100
Belgium	272,200	22,600
France	153,400	48,700
Switzerland	321,600	400
Spain	76,700	54,100
Portugal	11,500	28,100
Italy	325,300	15,800
Bulgaria	21,600	400
Servia	14,100	200
Greece	10,600	4,300
Roumania	464,100	2,400
Russia	187,000	30,000
Turkey	45,800	18,300
Egypt	40,200	123,800
Dutch East Indies	140,600	15,100
China	11,800	59,600
Japan	47,800	125,900
Brazil	156,500	231,700
Argentine	164,000	791,800
Chile	110,400	149,500
United States	47,500	300
Philippine Islands	11,600	1,500
Total to above markets	3,650,900	3,338,200
Total to all markets	4,383,000	4,661,000

In regard to South Africa the report of H.M. Trade Commissioner for 1913 states:—"Iron and steel pipes and fittings comprise a class of goods to which British manufacturers must continue to give very close attention. In the report for 1912 it was pointed out that Germany was making great efforts to capture this trade by means of her 'solid-drawn" tubing. At that time the only solid-drawn pipe in this market was the 'Mannesman,' but since then the 'Phœnix' (the product of a second German firm) has been introduced. The result of this fresh competition between German firms has led to a keen cutting of prices, which, incidentally, adds to the difficulties of British firms." H.M. Trade Commissioner also emphasises the fact that British firms locally represented are at a considerable advantage in tendering for the requirements of the South African Government as compared with firms who have no agents to submit tenders on their behalf. In a despatch written in July, 1913, the following particulars were given of German tenders submitted for the supply of 50,000 ft. of 4-in. screw piping required by the Johannesburg Municipality:—

	Successful tender (From Messrs. Baerecke & Kleudgen).	Next lowest (From Mr. A. Thienhaus).
Price per foot	1s. 5[illegible]d.	1s. 5·55d.
Thickness	Not stated	7 S.W.O.
Weight, per foot	8·4 lb.	8·3 lb.
Maximum length	30 feet	28 feet.
Minimum length	23 feet	18ft. 6in.
Average length	25 feet	24ft. 6in.
First delivery	12 weeks.	9 weeks.

New Registrations.

The following is a list of companies registered in September:—

Union Chrome Tanning Company, Ltd., Johannesburg; capital £7,500.

The Adler Garage, Ltd., Johannesburg; capital £8,000.

The Economic Sick Benefit Association, Ltd., Johannesburg; capital £5,000.

Rowland Chute & Company, Ltd., Johannesburg; capital £500.

Hassim Moti, Ltd., Pietersburg; capital £3,000.

Hughes Meat Market, Ltd., Johannesburg; capital £1,000.

The Kangaroo Tobacco Company, Ltd., Rustenburg; capital £800.

The Vryheid Coke Company, Ltd., Johannesburg; capital £20,000.

Northern Copper Syndicate, Ltd., Johannesburg; capital £100.

Manufacturers and Exporters Agency, Ltd., Johannesburg; capital £2,000.

Model Steam Laundry, Ltd., Johannesburg; capital £1,000.

Carson Mines, Ltd., Johannesburg; capital £4,250.

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ESTABLISHED 1891.

VOL. XXIV., PART I.] OCTOBER 17, 1914. [No. 1203.

HEAD OFFICE: 176-180, Stock Exchange Buildings, Fox Street (2nd Floor), Johannesburg, Union of South Africa.

Telephone **913.** P.O. Boxes **963** and **418.**

Cable and Telegraphic Address: "**MINING JOURNAL.**"

AGENTS FOR GREAT BRITAIN: Argus Printing and Publishing Co., Ltd., Byron House, 82-85, Fleet Street, London, E.C.

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ANNUAL SUBSCRIPTION RATES: Oversea, £2; South Africa (by post), £1 10s.; Local Delivery (Town only), £1 6s.

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NOTICE.—The postage of this issue of the *S.A. Mining Journal* is: South Africa, 1d. All other parts, 1½d.

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Notes and News.

Gold Strike in Zululand.

News has reached Pietermaritzburg to the effect that Mr. Pippin, who is prospecting on the Maultz Claims in Zululand, has succeeded in striking gold which averages 12 dwts. per ton from 10 tons of quartz milled, by amalgamation. It is also said that there are at least 12 dwts. of gold in the tailings. The gold in question was obtained in a trial crushing from a three-stamp battery. Maultz Claims are situated at Nkunzan, near the now abandoned Nkandhla goldfields.

* * * *

Cyanide Supply.

Cyanide conditions in the United States are still bad and it is not yet apparent from whence an adequate supply of the salt is to come, says an American contemporary. The plant at Perth Amboy is running full capacity but is hardly likely to be able to carry the full load, besides which the supply of raw materials may become difficult. Large shipments of cyanide ordered by various firms shortly before the outbreak of the war may still come through, and while the excess carbon and calcium carbide will interfere with the use of cyanamid, it may still be possible to use that salt, of which there is an abundant supply, in special situations. It happens that arrangements were under way to manufacture cyanide from cyanamid when the war broke out. The right to use the necessary patents had been secured and the machinery was in Berlin ready for shipment. It is just possible that it may still come through. However, for the present there is a sufficient supply, and care and forethought may be depended upon to make the best of the situation. It it hardly likely that the shortage will, in the end, be as serious as was at first feared. An article on the manufacturing of cyanide from cyanamid appears elsewhere in this issue.

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The Market in Mining Shares.

It now appears that Rand mining share speculations open at the time of the war crisis in London in the great majority of cases were on an extremely small scale. For quite two years past events had been of such disquieting character as to deter the usual trend of speculators to dabble in the Stock markets, and London authorities tell us that the volume of speculative account carried over at each settlement had been constantly shrinking in the mining department. Prior to the *débâcle* prices of several shares were estimated by experts as much undervalued; not invariably so, however, for in some securities of international character speculations for the fall are known to have been kept open. Further speculation for the fall occurred in July in De Beers, Rand Mines, Modders, and some of the deep-level Rand mining shares. In such class of free-market securities late in July the extent of speculation for the fall was greater than the small extent of open speculation for the rise. One or two of the Eastern Rand companies' shares had been speculatively bought on the prospects as they were prior to the war chaos. Attention has to be given to the fact that, apart from the influence of the war on individual securities, the intrinsic merits of mines of approved or promising character are but little affected. There are some exceptions in respect of mines producing base metals. With gold mines the outlook is in general of continued effort to increase output. Plainly those persons who are not under the necessity of selling for cash requirements will be well advised to refrain from doing so at any thing like what is understood to be the current level of cash prices.

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A Paris Sidelight.

La Revue Parisienne de Banque et de Mines, for September 5 is, unfortunately, missing, and in its place we are in receipt of the following little note from the Editor, which has a melancholy interest:—"Malgré les vides causés dans le personnel de notre Rédaction et dans celui de notre imprimerie par la mobilisation générale, nous avons fait tous nos efforts pour continuer à paraitre et à renseigner nos lecteurs dans la mesure du possible. Nous nous trouvons malheureusement privés aujourd'hui du concours des rares collaborateurs qui nous restaient et nous nous voyons, à notre grand regret, obligés de suspendre la publication de la *Revue* jusqu'au rétablissement des conditions normales."

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Tin Prospects.

The recent fluctuations in the price of tin caused considerable anxiety in the Malay Peninsula, as tin is the backbone of the country, and evoked much press comment on the subject. In this connection the following excerpt from an editorial appearing in the *Malayan Tin and Rubber Journal*, Ipoh, should be of interest:—" Mining methods are undergoing a gradual change in this part of the world by the introduction of the dredging system, which we believe is to have an effect upon the industry that at the moment is barely realized. We have gone carefully into the question and are led to the conviction that tin in the next two years will reach a level considerably lower than the average of the last two years. Nineteen dredges have been placed on various properties in Malaya and Siam. The ' probables ' actually number 24, for in addition to the Taiping and Siamese propositions mentioned, there is every chance of two other dredges being laid down in Taiping and three in Siam. All this in a way is a healthy sign . . . but it also means a greatly increased output, a conservative estimate of the monthly output of the average dredge being 400 piculs ($26\frac{2}{3}$ short tons). Now, above that we have to take into consideration the development in Nigeria, which, while not on the same scale as we are witnessing here, is still sufficient to make a good impression on the market. It is well known that some of the dredges are producing 600 piculs (40 short tons), and other methods are being pursued, including hydraulicking, lode mining, and calabashing. All that signifies a greater output. Bolivia, too, is reported to be showing excellent development work, and on the whole is systematically prosecuting the industry. The market, therefore, will not only have to bear an increased output from Malaya, but also from Nigeria and Bolivia."

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National Union's Activities.

The South African National Union has addressed a letter to the various co-operative societies in the Transvaal requesting them to make a further appeal to members to increase the quantity of foodstuffs to be grown during the coming season. The prospects of the Oversea markets next year, it is pointed out, are so encouraging that it will be regrettable if the South African farmer does not now take steps to obtain his share of the profits that are bound to be made. The opportunity presented is twofold. There will be in South Africa itself an increased demand for many articles for local consumption, owing to the curtailment of supplies from Oversea, while the demand from Europe will be greater than ever before owing to the disorganisation caused by the war in those countries which usually are large producers. Our maize, for one thing, has obtained so excellent a name that it will be eagerly sought after, and, in fact, all our products will be in active demand. There is no fear that the activities of the farmer are likely to be interfered with except perhaps in one or two districts. Every farmer is, therefore, urged to produce as much as possible during the coming and succeeding seasons, for increased profits will be undoubtedly secured. Present difficulties in the sale of produce are only the result of the large demands on shipping for the transport of troops. This difficulty will be shortly removed, when prices will again become normal.

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Trade Relations of the British and German Empires.

It may be useful to some readers of the Journal if a few of the statistics showing the salient features of German and British intertrading are set down for reference. So far as possible they are the figures for 1913. British imports in 1913: from Germany and Austria, £88,000,000; from the rest of the world, £681,000,000; Great Britain's exports to Germany and Austria, £45,000,000; Great Britain's exports to the rest of the world, £480,000,000. *Vorwärts*, the well-known German Social Democratic organ, says: " If the British blockade takes place, German imports of roughly £300,000,000 and exports of £400,000,000 will be interrupted." Among the items included in these totals are £3,650,000 worth of cotton from Egypt; £2,900,000 of cotton from British India; £5,000,000 worth of jute from the same countries; merino wool to the value of £6,050,000 from Australia. German food supplies would suffer by the loss of the following foodstuffs from British sources: wheat from Canada worth £4,050,000; rice from British India to the value of £2,300,000. " No one who contemplates these facts without prejudice," concludes the *Vorwärts*, " to which many others could be added, will be able lightly to estimate the economic consequences of a war of long duration." Germany's imports when the Kaiser ascended the throne in 1888 were valued at £163,000,000; they are now £534,000,000, and her exports have increased during the same period from £160,000,000 to £504,000,000. This marvellous expansion, artificially supported and stimulated by the Government, explains much of the confident attitude of Germany's leaders; it also shows the tremendous risks which she has been forced to incur by those who are responsible for her schemes of political aggrandisement. The proportions occupied by her trade with the whole of the British Empire can best be seen from the accompanying tables, taken from a paper read by Mr. Edgar Crammond to the Royal Statistical Society in London lately on " The Economic Relations of the British and German Empires."

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Miners' Phthisis Enquiries.

Advantage was taken by the Secretary for Mines of a brief visit to London during the year to discuss phthisis and dust questions with the authorities at the Home Office. Dr. Collis, of the Home Office, was just completing a number of experiments and investigations for the Phthisis Commission which was then about to report. It would appear from experiments made in England that it was thought that in some cases cold water was likely to be ineffective in catching and laying very fine siliceous dust, the fine particles being likely to be repelled by the drop of water in the same way as may be observed in the case of raindrops on a dry and dusty road. Expanding steam, on the other hand, had been ascertained to bring to earth, while condensing, every particle of solid matter in the atmosphere, however small. This point was referred to the Miners' Phthisis Prevention Committee in Johannesburg, and the opinion was expressed that the application of steam to underground workings in mines was impracticable, owing to the great danger of creating high temperatures and thus overheating the workings. Another point upon which the English authorities seemed to have come to a very clear-cut conclusion was with regard to the causes of death in cases of silicosis, namely, that silicosis alone never causes death. In other words, tuberculosis was believed to be always present in the final stages, the fibroid lung becoming increasingly liable to attack by tubercular infection and being invariable caught by this infection at the end. The conclusion was that a sufferer from silicosis may live for years if he is kept away from tubercular infection. The Medical Sub-Committee of the Miners' Phthisis Prevention Committee state on this point that the above is recognised as being the fact in the great majority of cases, but occasionally cases occur in which death is due to heart failure from obstructed circulation in the fibrous lung, without any evidence of tuberculosis. This is stated by the Committee to be much rarer than formerly was the case. If this is the position, an avenue of hope is opened up for all men who are in the earlier stages of the disease, and it explains the fact that many cases can be quoted in which men leaving the Rand

and going to other healthy open-air surroundings after contracting the disease of phthisis appear to have improved very materially in condition. The disinclination of some public bodies to employ men in the earlier stages of the disease and the absence of general recognition of the above fact and of any organisation to obtain avenues of employment for patients are much to be regretted.

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Growth of Wealth Since Waterloo.

Sir George Paish, one of the Editors of *The Statist*, has been appointed by the Chancellor of the Exchequer to assist the Treasury in problems of finance and economics which will arise out of the war. Special authority accordingly is given to an article which appeared in the Foreign Banking section of that journal a few weeks ago, and which is of special interest in South Africa at the present juncture; reviewing, as it did, the increase of wealth in the leading nations of Europe and overseas since the days before Waterloo. The article gives certain details which may be quoted to show the relative growths in wealth, and the economic resources now available to carry on the struggle. In 1814 the wealth of the United Kingdom was computed to be about 2,500 millions sterling, now it is (on a moderate estimate) over 17,000 millions; the income of the inhabitants of the Mother Country has gone up about eightfold from 300 millions sterling to 2,400 millions in the same period. France has increased in wealth fivefold, from under 2,000 millions to nearly 10,000 millions. While the population of the United Kingdom has increased by 130 per cent., France has a population only 33 per cent. greater than she had at the period of Waterloo. "A century ago there was no Germany—only a number of German states by no means overburdened with income or riches. Their aggregate wealth and income were probably less than France's. Now United Germany is estimated to possess an income of nearly 2,000 millions sterling, and accumulated wealth of about 16,000 millions." Moreover, during the past century, German's population has rapidly increased from twenty-four millions to over sixty-seven millions, or by 180 per cent. Great Britain at the present times saves about 400 millions a year, according to Sir George's calculations. Of this, about one-half is put into investments with home and foreign states, municipalities, corporations, and companies; some 160 millions is lent privately, and the remainder is left with the bankers. The total of British capital invested in foreign countries and in the Dominions he estimates at about 4,000 millions. France saves about 200 millions a year, of which at least eighty millions are invested annually in foreign countries. Peculiar characteristics of the French people are their well-known liking for private hoarding, and the large deposits which they leave with their bankers for investment. Considerable control of foreign investments by the Government has given substantial aid to countries with which she has been politically allied—notably in the case of Russia within recent years. The amount of French money and capital invested abroad is not far short of 2,000 millions. German savings annually amount to about 300 millions, of which about two-thirds are invested in securities. Investors leave large deposits with their bankers for investment according to their discretion, and the Government exercises a strict supervision, for political and financial reasons, and "sometimes prohibits the introduction of individual foreign securities into Germany." Nevertheless, foreign investments have become increasingly popular and profitable to the German people, who till the past two or three years annually invested an additional fifty millions of their savings in foreign countries; the total is estimated at about 1,600 millions sterling. "Recently the sum has been somewhat reduced in consequence of the desire of the country to strengthen the financial position of its own great industries, and to repay the large amount of floating debt which German borrowers had incurred in France and in other countries."

TOPICS OF THE WEEK.

MONEY AND THE WAR.

According to the latest advices from London the money market there is gradually returning to its pre-war condition. The fact is of the utmost significance to us all in South Africa, in view of the dislocation of public and private finance that followed the outbreak of hostilities. Now that the worst is over, it may be admitted that the crisis in London might have had a very serious effect on the whole fabric of South Africa's prosperity, and but for the timely action taken by the Union Government, aided by the Imperial Government, things might have been very different with us to-day. We know now that the Imperial Government came to our aid with a credit of £7,000,000, which had the immediate effect of enabling the Union Government by the adoption of bold, statesmanlike measures, to put the public finance of South Africa on an impregnable basis. How real the help and how critical the need may be seen from other financial results of the crisis. The big loan required for the Rand Water Board's Vaal River Scheme has, we all know, had to be indefinitely postponed simply because the globular sum required for the work cannot be forthcoming in the present state of the money market. Then again we have the fears openly expressed in our own columns and elsewhere by responsible mining men that money for continuing the development of some of our Far East mines, such as Daggafontein, may not be forthcoming when and as required. These, after all, are but a few of the more obvious evidences of the buttoning up of the pocket of the British capitalist at the first shock of war. As confidence returns, credit, of course, will flourish again, and this country obtain cheaply and easily the enormous sums still essential to her farming, mining and general development.

So much for the effect of war on finance. The effect of finance on war will only be seen later, but it is bound to be no less marked. Wars have been decided before by the arbitrament of the longest purse, which is another way of stating, by the preponderance of economic resources. Strategists turn to-day to the Napoleonic Wars for guidance in the present struggle. To us there is hope and light in the fact that by the time Napoleon was finally crushed England had been called upon to finance all her Allies in the fight. Economic strength must count for even more to-day, in the increased complexity of modern warfare, than it did a hundred years ago. Never before did money and engineering skill and science play so large a part in warfare as to-day, and in these directions we can be confident of success. Some of the Allies of the Empire may be poor as nations go in big guns or ships or funds. But they are rich in the spirit and number of their fighting men, and the British Empire will help them, as it did in Napoleon's time, to carry out the policing of Europe and civilization against the latest usurper of world power.

War, of course, in no circumstances, can be described as good business; nor do we cherish any toplofty ideas that it means the uplifting of degenerate mankind. It is a calamity, and the issue will be decided by, amongst others, the great money factor. And when, as in the case to-day, to a preponderance of that power upon our side there is joined a patriotism prepared to spend its last penny—the expenditure of the last drop of blood being always understood—in the cause of right, the ultimate issue cannot be for one moment in doubt.

THE SOUTH AFRICAN SCHOOL OF MINES AND A NATIONAL UNIVERSITY.

The report of the University Commission, issued this week, is a singularly disappointing document. Alike on general educational grounds and because of the place assigned to the South African School of Mines, the report is bound to be unfavourably received on the Rand. Already, indeed, it has been unanimously and roundly condemned by the daily papers of Johannesburg, which in this matter, it is only fair to say, have always taken the big and broad view. The Commission has fallen a victim to the separatist desires of all the divergent interests concerned. As the Chairman of Council of the S.A. School of Mines, Mr. Samuel Evans, and the Chairman of the Senate, Mr. George Corstorphine, point out, the scheme now proposed will promote neither the much-desired racial union nor educational progress. On more immediate grounds the School of Mines and Technology expresses equally strong objections. In various communications made to the Select Committee last year, the Council and the Senate expressed their willingness to become part of a central University, but if there are to be two Universities, with the idea of affiliating or federating the School of Mines with one of them—the weaker, according to the Commission's suggestion—neither Council nor Senate will take part in such a scheme. We cannot do better than quote the further views of the School Council and Senate as set out in the memorandum aforementioned. It is there pointed out that those interested in higher education here have always felt that the first step must be the development of a strong School of Mines and Technology, and, for that reason, they acquiesced in the transference of the Arts courses to Pretoria some years ago. It must be realised, however, in the event of the system of local colleges being perpetuated—for that is what the Commission's proposals amount to—that, in a town of the importance of Johannesburg, the demand for the founding of a local University College will be a strong one. It is largely in the hope that the School of Mines and Technology would one day be included in a national University that the Council and the Senate have accepted their present limitations, but, if this hope is not to be realised, the natural demands of the community are not likely to be restrained. Moreover, as was pointed out by Mr. Cullen in his evidence before the Select Committee, it was intended that the people of Johannesburg should benefit by £200,000 of the total sum of £500,000 which it is now proposed to hand over to the Western University. Under these circumstances, the School of Mines feels that only the foundation of one strong University, which shall benefit the entire Union, will justify its acquiescence in the diversion of a sum of money intended to benefit the people of the Witwatersrand. At present the School is a national one, drawing its students from all parts of South Africa. It is independent of any other institution, and arranges its own syllabuses and courses, and conducts its own examinations—the professors acting as examiners along with external examiners appointed by the Council, subject to the approval of the Minister of Education. In its diploma courses a certain percentage of attainable marks is allotted for examinations, exercises and practical work done throughout the year. The students are not students of the Cape University. The diplomas are granted by the School Senate and they have the same practical significance, in South Africa at least, as a degree. Neither Council nor Senate sees any reason for sacrificing the independence of the School in order to become attached to such a University as the proposed Northern one. A more natural process would be to develop into the University of Johannesburg. It is reasonable to expect that in the future there will be more than one University in South Africa—one probably arising in the North. It should, however, in the opinion of the Council and the Senate of the School, be a centralised teaching University, and not the weak federal union of a number of small colleges, which is the best the University Commission, as a counsel of despair, is able to recommend.

COMPANIES AND FIRMS AS ENEMY SUBJECTS.

The latest statement issued by the Union Government in regard to trading with the enemy by no means disposes of all the contentious questions raised in that connection. The debate in the Imperial Parliament on the Trading with the Enemy Bill illustrates the complexity of the problem. Some of the points in the debate are illuminating. At the outset Mr. Samuel Roberts moved to omit the whole of the first clause on the ground that the Bill should apply to companies carrying on business in the United Kingdom whose boards were entirely composed of Germans, and which had been established for the express purpose of undermining British trade. Clause 1 was carried, but at the instance of the Attorney-General an amendment was carried enabling the Board of Trade to inspect the accounts of a company which has anything like a predominantly hostile composition, not only where the directorate or share capital is predominantly German, but also where the share capital is held on behalf of persons satisfying that condition. This, he said, would prevent the transfer of shares to nominees. By a further amendment the powers of the Board of Trade were extended to " persons," in addition to " firms " and " companies." The Attorney-General, in order to meet the point raised by Mr. Roberts, moved also an important amendment to Clause 3, which involved practically the redrafting of the clause. The clause as it now stands gives the Board of Trade power to appoint a controller of a firm or company in cases where (a) an offence has been committed or is likely to be committed under the Act; or (b) the control or management had been or was likely to be so affected by the state of war as to prejudice the effective continuance of its trade or business—these measures being limited to cases in which it is to the public interest that the businesses should be carried on. The Attorney-General thought it would be very short-sighted policy to close down all such businesses arbitrarily; it would cause unemployment, greatly embarrass other branches of trade, and would lead to reprisals. Such power would not be exercised on the mere information of biassed or jealous competitors. Apart from that, it was necessary that subsidiary industries, which had been necessary in order to maintain the great staple industries, should be kept going. In the course of replies to various questions, Sir John Simon said they had reserved power to modify the latest Proclamation from time to time. There was a committee sitting—a Trading with the Enemy Committee—of which he was chairman, and in the course of two or three hours every day it passed in review hundreds of applications. As regards the position of companies registered as English companies but which were, in substance, enemy's concerns, of course it was to be observed that, even although the shareholders of a company might be enemies, if they took proper steps to prevent the profits of such a concern being distributed to the enemy, it might be that such an enterprise was a very useful way of employing labour in Great Britain. The Bill did not profess to deal with such companies, except to confer on the proper department of State power to investigate the books of any such country in order to ascertain the facts, and, having ascertained the facts, the Board of Trade, in a Bill which it was proposed to introduce, would suggest a proper way of dealing with such a company. He added that dividends were not to be transmitted to the enemy's country. They should be duly secured and paid into a bank where they could be safely earmarked for their true owners. As regards payments which English merchants or others wished to make in discharge of their just debts to agents in Great Britain of firms established in the enemy's country, he thought there was very grave doubt whether a man who acted in Britain as the agent of a German or Austrian firm could really and truly be said to have any agency once the war had broken out. He hoped, however, it might be possible to make arrangements in these cases. From which it will be seen that in connection with the complicated and manifold questions arising out of financial and commercial relations with the enemy much remains unsettled, and we in this country can best take our cue from the procedure adopted, or to be adopted, in Great Britain.

RAND INDUSTRY AND THE PROGRESS OF THE WAR.

Importance of "Carrying On" as Usual—Government and the Recruiting Question—Patriotic Efforts in Other Directions—Drilling Activity and Fund-Raising Efforts.

THOUGH all ranks of those concerned with the great industry of the Rand recognise that their first duty lies in "carrying on," there is no lack of patriotic activity in other directions. Practically all who could be spared have already volunteered for active service, and those who have had to remain at work are busy helping in their several ways in all their available leisure. From the first, an excellent example has been set by the leaders of the industry. Having successfully completed their initial task of safeguarding the supplies essential to the working of the mines, they have spared neither time nor money in helping the defence organisation of the country. We need not specify the amounts of the different subscriptions; it is enough that they are worthy of the best traditions of the Rand. In regard to subscriptions to the various patriotic funds from the rank and file on the mines, there is nothing to add to what we wrote in a recent issue, estimating that an annual sum of about a quarter of a million sterling will be forthcoming from the mine workers of the Rand. No other industry in the Empire, we believe, has made anything like so splendid a response.

RECRUITING AND THE GOVERNMENT

The Transvaal Chamber of Mines has received the following letter from the Department of Defence in regard to the question of mine employees volunteering for service at the front, and the importance of there being no dislocation of the mining industry or diminution of the gold output through too many of the employees volunteering:—

Department of Defence,
Pretoria, 11th October, 1914.

Sir, I am directed by the Minister of Defence to state that the Government is exceedingly anxious to secure the hearty co-operation of all mining companies and employers of mining labour on the Witwatersrand and elsewhere in assisting the war recruiting scheme to the utmost extent, but the Government is equally anxious that there should be no dislocation of the mining industry or any diminution of the gold output owing to mines being depleted below the minimum staff of European employees which is essential to maintain the industry in full working order. The Government is profoundly gratified at the keen and enthusiastic response to the call to arms which has been given on the Witwatersrand and elsewhere, but it hopes that citizens whose services are essential to the proper working of the mining industry will recognise that their duty to the Union and to the Empire lies not at the front, but in keeping this great Imperial and South African asset—the gold industry—working to its fullest capacity. The Minister understands that the mining companies are prepared to give generous terms to their employees who volunteer for active service and can be spared, the terms being half pay to all such men as have dependents, and a promise of re-employment on return from the front. The Government, however, does not for a moment suggest that these terms should be offered to employees whose services really cannot be spared without serious detriment to the working efficiency of any particular mine. The recruiting committees and recruiting officers on the Witwatersrand are being notified of the Government's attitude in this matter, and the Minister is confident that the Government can count on the good sense and patriotic spirit of the people of the Witwatersrand to support them.

I am, etc.,

H. R. M. BOURNE,
Secretary for Defence.

The Secretary to the Chamber of Mines, Johannesburg.

V.C.T.A. DRILLING ACTIVITY.

In another excellent direction the energies of the men on the mines are being displayed. Drilling under the auspices of the V.C.T.A. is everywhere proceeding along the Reef, and the following list of those responsible for the various training units shows how general the movement is:—

Ferreira Deep.—Mr. J. Rockey (P.O. Box [illegible]), Ferreira Deep.
Parkview.—Mr. J. D. H. Lang (P.O. Box [illegible]), Parkview.
Parktown.—Mr. R. Currie (P.O. Box [illegible]), Parktown West and Houghton Estate.
Parktown North.—Mr. J. C. Williams (P.O. Box 1195), Rosebank, Illovo, Melrose and Zandfontein.
Booysens.—Mr. J. J. Wessels (P.O. Box [illegible]), Robinson Deep, City Deep, Village Deep, Booysens, Ophirton, Village Main Reef, City and Suburban, Meyer and Charlton.
Melville.—Mr. W. H. Green (P.O. Box 1169), Richmond and Melville.
Doornfontein.—Mr. W. L. Cornwall (P.O. Box 4897), Doornfontein, Bertrams and Judith's Paarl.
Wolhuter.—Mr. J. E. McGuire (P.O. Box [illegible]), Wolhuter.
Brakpan.—Mr. J. N. Robson (P.O. Box 3, Brakpan), Brakpan Township, Brakpan Mines, Ltd., Brakpan Power Station, Government Gold Mining Areas.
Modderfontein.—Mr. E. Myles Sharp (P.O. Box 25, Benoni), New Modderfontein, Modderfontein B, Van Ryn Gold Mines Estate, Ltd., Modderfontein Deep Levels, Ltd.
Benoni.—Mr. W. A. Hill (P.O. Box 315), Benoni Township, New Kleinfontein, Apex and Van Ryn Deep.
Cleveland.—Mr. R. A. Barry (P.O. Box 32, Denver), Cleveland, Denver, Geldenhuis Deep, Rosherville Power Station, New Heriot, Nourse Mines, New Goch.
Germiston.—Mr. W. Young (Resident Magistrate, Germiston), Germiston.
Simmer Pan.—Mr. C. W. R. Campbell (P.O. Box 163, Germiston), Simmer Pan.
Springs.—Mr. D. W. Morgan (P.O. Box 42, Springs), Springs.
Germiston.—Mr. E. P. Pearce, J.P. (Box 325, Germiston), Germiston.
Rosherville.—Mr. Morton (V.F.P. Co.), Rosherville.
Roodepoort.—Mr. Girdler Brown (P.O. Box 15, Roodepoort), Roodepoort.
Crown Mines.—Mr. R. A. Warriner (P.O. Box 102, Crown Mines), Crown Mines.
Consolidated Langlaagte.—Mr. A. E. Payne (P.O. Box 15, Langlaagte), Consolidated Langlaagte.
Maraisburg.—Mr. I. R. Gibson (Central Hotel, Maraisburg), Maraisburg.
Consolidated Main Reef.—Mr. J. E. Healey (P.O. Box 2, Maraisburg).
Langlaagte Estate.—Mr. H. Mitchell (P.O. Box 1640, Johannesburg).
[illegible] G.M. Co.—To be appointed by Mr. Palmer Carter.
New Unified G.M. Co.—Mr. Marks (P.O. Box 5, New Unified, Maraisburg).
Aurora West United G.M. Co., Ltd.—Mr. J. K. Digby (P.O. Box 25, Maraisburg).
V.F.P. Co., Vereeniging.—Mr. Redmond, G.M.
Randfontein.—Mr. J. H. Crosby (P.O. Box 2, Randfontein).

ROCK DRILLING CONTEST AT RANDFONTEIN.

A patriotic hand rock-drilling contest held on the Porges football ground at Randfontein on Saturday last was a distinct success. Many of the competitors had participated in similar contests in America, Cornwall, and elsewhere, but this was the first contest of this sort ever held in South Africa, and the results were considered satisfactory. The arrangements were in the hands of the following committee: Messrs. C. A. Ferguson (president), J. Craze (chairman), Harry Bennetts, H. Trewren, J. Lawrence, sen., J. Beard, J. Boase, Joe Kistle, with J. C. K. Pollock (hon. treasurer) and A. E. Canavan (hon. secretary). The judges were Messrs. Wannacott, Tippett and Johns, and Messrs. C. K. Thomas and A. Edwards rendered good service as timekeepers. Credit is due to Messrs. Craze and Bennetts for their hard work in getting the rock on the ground and decorating it, as well as to Mr. Ferguson and the directors of the Randfontein Estates for giving every facility. The results were as follows, the contest being one of ten minutes: Single hand: Nick Mathews, 7 inches; Tom Harvey, 5⅞ inches; T. Murley, 5¾ inches; J. Wearne, 5¾ inches; J. O. Reseigh, 4½ inches; L. Smith, 3½ inches; J. Rose, 2½ inches. Two hammers and twister: J. Angove, N. Redda and J. Boase, 24¼ inches; H. P. Rowe, R. Davey, and S. Keast, 20¾ inches; B. Spragg, T. Carpenter, and W. Carnow, 19½ inches; H. P. Rowe, A. H. Rowe, and F. Rodgers, 19¼ inches; J. Pascoe, W. Ham, and W. Richards, 12¼ inches; S. Crocker, H. Trewren, and G. Martin, 10¼ inches. Double hand: F. Carpenter and S. Keast, 13 inches; H. P. Rowe and A. H. Rowe, 12¼ inches; J. Trembath and H. Rowe, 12 inches; J. H. Angove and F. Goldsworthy, 11¾ inches. The tie between Murley and Wearne for second and third prize was won by Murley with 5 11-16 inches. The first prize in the single hand and the three in the two hammer and twister were presented by Mr. Ferguson, the second and third prizes in the single hammer by Messrs. Wannacott and Kaizer; Mr. W. H. Robinson providing both prizes for the double hand.

HAS THE RAND GOLD PRODUCTION REACHED ITS ZENITH?

Representative Views of Leading Mining Men and Economists—Suggested Limitation of Output—Will the War Affect It?

AT a recent meeting of the Chemical, Metallurgical and Mining Society of South Africa, Professor Lehfeldt, in the course of a paper on "Gold and Prices," expressed some interesting views on the future of Rand gold production. *Inter alia*, he said:—

In considering the likelihood of future production, the most important matter is that there are plain indications that the present spurt in gold production is weakening. The following figures are very instructive:—

RECORDED PRODUCTION IN TONS.

	Transvaal.	Rest of World
1909	227	456
1910	234	451
1911	257	436
1912	283	415
1913	274	411

It is clear that, but for the Witwatersrand, there would have been a marked falling off already: how long will the Witwatersrand be able to keep its output up to the present level. Here the points to consider are: (1) The published estimates of the contents of the present mines, (2) the existence of low grade ore in them; (3) the undeveloped areas beyond; (4) the tendency to rising costs, owing to rising world prices, to greater demands on the part of the workmen, and to the prevalence of miners' phthisis: and, in the opposite sense, efforts at greater efficiency. My own conclusion on this frankly controversial matter is that the output of the Witwatersrand is not likely to increase. Of course, one must recognise that forecasts may be upset at any moment by some new discovery of gold ore, or by a new process for treating ores of low grade. But, putting aside the unforeseeable, it seems as if in ten years a reduced output would have to meet larger demands for gold in the arts: and that the balance, having to be reckoned as percentage of a larger stock than now, is not likely to be more than enough to sustain the level of prices. If this view is correct, the present period of rising prices is drawing towards its close, and will be succeeded by a fall. This is what happened with regard to the spurt given by the Californian and Australian discoveries. It would follow that remedies for the rise in prices are not so urgently needed as has been thought. Revolutionary suggestions, such as that of Professor Irving Fisher's "standardised dollar," would not be justified unless the disturbance due to price changes turns out to be greater than is estimated in the present paper. It is, however, suggested that there might be international regulation of output. This is an operation that has been attempted, with regard to other minearls, by financial groups, in their own interest: could it not be done for gold, by a combination of Governments, in the interest of the public? The details of such a scheme must be left for discussion on another occasion. P.S.—The above was written before the outbreak of the European War, which is likely to modify some of the data in the forecast.

In the discussion that followed, Mr. R. A. Barry said:—"With regard to the gold output of the world, especially that of the Witwatersrand. I am sure that there are a good many people who have given the matter grave thought, and I believe that the consensus of opinion with regard to the Witwatersrand gold output is that we have to-day reached our highest figures, unless there are fresh discoveries in front of us. In the light of present knowledge it would appear that we certainly have reached our high water mark, we may remain at that mark for some time, but afterwards our output must gradually decrease."

Professor J. S. Celliers also remarked:—"As regards the Rand, I am afraid we have seen the zenith. We have been hearing that 8 dwt. reef has been discovered at Daggafontein; but meanwhile a lot of 8 dwt. reef is being worked out, and in depth we generally find reefs of lower grade."

THE SOUTH AFRICAN SCHOOL OF MINES; AN APPRECIATION.

[BY PROF. JOHN PERRY, M.E., D.Sc., LL.D., F.R.S.

THE Johannesburg School of Mines and Technology is a very well equipped College. There are good electrical and mechanical laboratories as well as electrical and mechanical engineering laboratories where the students and professors are doing excellent work, some of it in original research, although the results may not be published. The Professor of Mechanical Engineering has obtained from mining friends specimens of engines and pumps, etc., which furnish fine subjects for research by students. Also he takes his students to test large engines and other machines which are doing actual money-making work, under real working conditions. This is the best kind of work for advanced students. Indeed the teaching of Mechanical Engineering is very complete. There are many engines, steam, oil, petrol and gas engines with suction gas plant, air compressors, etc., all arranged so that students can experiment with them. Dynamos and alternators may be driven by the engines and in one case a dynamo is driven by a powerful steam turbine. This is the only College in South Africa where I have seen a good laboratory for experiments on Practical or Applied Mechanics, the friction and efficiency of machines, etc. The metallurgical laboratory is large and very well equipped and the mistake made elsewhere of having furnaces, etc., of huge size which really scare the students, has not been made here. But although the equipment of the School in Engineering subjects gives excellent laboratory work for students, a great deal of money must be spent before the School is as fit for its work as any one of twenty Schools in Europe and America which might be mentioned. The laboratories for Physics and Chemistry and the pure sciences are very well equipped with good apparatus. I was glad to see that the study of the subject of Metallography is being well developed. I was struck with the size of the large Physics lecture room, but I was told that, large as many of the rooms are, they are much too small for the numerous evening students. In some cases a class of apprentices has to be divided into two distinct classes, the lectures and practical work being duplicated and even further sub-divided because the rooms and provision of apparatus are not large enough. This greatly increases the work of the staff. Some of the professors of the school are doing most important and rather heart-breaking work in directing the instruction of apprentices at many centres on the Rand. If this instruction is to compare favourably with similar work in England, there must be a much greater expenditure of money than there is at present in salaries, in schools, and in scholarships enabling the best students to attend the day classes at Johannesburg.

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[*] Being an extract from a report by Professor Perry, published as an appendix to the report of the University Commission.

New Modderfontein.

The report of the directors of the New Modderfontein for the quarter ended the 30th of June states that the plant has run to its full capacity, milling 154,750 tons, an increase of 23,050 tons as compared with the quarter ended March. The value of the yield was 2s. 5d. per ton milled less than in the previous quarter, which is more in accord with the average value of the ore development. Working costs have shown a satisfactory decrease, concurrently with the larger scale of milling operations. A sufficient quantity of development work has been done, and reef disclosures have on the whole been favourable, both in the upper portion of the mine and in the district developed from the circular shaft. The ore reserve is now being re-estimated and re-valued, and indicates a generally improved position. The new steel headgear at the circular shaft is nearing completion, and structural work on permanent buildings is well in hand. The capital expenditure for the quarter, mainly for development and construction at the circular shaft, totalled £35,890—the balance of working capital on hand is therefore £52,358. As interim dividend, No. 16, of 15 per cent. was declared on the 9th of June, 1914, for the half-year ended the 30th of June, 1914.

MANAGER AND UNDERGROUND STAFF OF THE KNIGHTS DEEP, LTD., SEPTEMBER, 1914.

THE RAND BANKET CONTROVERSY REVIVED.

Mr. C. B. Horwood's Reply to Dr. F. H. Hatch's Criticisms—Some Points in the Opposing Views.

Mr. C. B. Horwood, in the latest issues of the *Mining and Scientific Press* to hand, continues his reply to the critics of his recent series of papers on the origin of the gold in the Rand banket. Mr. Horwood seems certainly entitled to the credit for the discovery of the metasomatic origin of some of the rounded and flat pyrite pebbles of the bankets. His researches not only show that the original structure of the quartz formerly the substance of the pebbles is visible under the microscope, but that in some specimens the process of replacement by pyrite was still in progress. It is a fact that such pyrite pebbles are very abundant in the battery series of the West Rand and also especially the round ones in the Langerman's Kop and Rietfontein series. Also in the Kimberley series of the Far East Rand. The occurrence of such pebbles in the Main Reef series is very rare, and in the instance referred to by Mr. Horwood at the Crown Mines it is to be noted that they occur in the reef over a limited extent close to a dyke. It is probable that the metasomatic action has been induced by conditions of heat and pressure due to this dyke. Some are of radiate structure and others are micro crystalline. These latter, Hatch agrees with Horwood, are pseudomorphs after quartz pebbles, and he admits that some of these having radiate structure may also be in part of like origin. It seems to us that Dr. Hatch is not quite fair in apparently withholding credit to Mr. Horwood which is evidently his due. We venture, however, to suggest less acrimony in such a discussion when original research work like that done by Horwood, which has led to the definite discovery that, at any rate in some cases, pyrite pebbles have resulted from the replacement of the original quartz by pyrites. It seems invidious to claim that it is only a development of general ideas of the mineralisation of the Rand beds held years ago. There is a great difference between such work and a vague statement unsupported by detailed evidence. The field of investigation of the mineralisation of the Rand bankets is a very interesting and important one. So far the men who have done by far the most detailed and original work in it have undoubtedly been Professor Young and Mr. C. B. Horwood. Sometimes they have had differences of opinion as to the conclusions arrived at from the facts they have demonstrated, but both have greatly added to our knowledge, and their work may eventually have far-reaching effects on the fortunes of the Rand mining industry. Such facts as have been brought to light are considered, we may be sure, by other students of the Rand and collated with their own individual experiences, and it is possible that means of identification and correlation of the various reef series and their extensions may thereby be provided to workers who have not the means to undertake such useful and difficult research work themselves. Such work therefore, besides its scientific value may prove eventually to be of great economic value also.

Mr. Horwood's Reply.

From Mr. Horwood's reply we extract the following

> In my paper I showed that the metasomatic origin was indisputable, as the structure of the material replaced was frequently plainly discernible under the microscope; in many cases where quartz pebbles had been replaced, their original outlines and internal structure were readily revealed by the microscope. Moreover, Fig. 15, 16 and 17 showed

pebbles actually in process of replacement by pyrite. My explanation of the radiate structure was expressed as clearly and in as simple language as possible.

At the Crown Reef mine, pebbles of iron pyrites occur in close proximity to a dyke, at the base of the Main Reef Leader conglomerate and immediately overlying a band of shale. The matrix of the Main Reef Leader is, here, very pyritic, especially at its base. The dyke is black in colour, of a very basic character, is highly decomposed, and has developed (doubtless due to pressure) a shaly, fissile structure. The intrusion of the dyke was accompanied by a normal faulting movement, which has thrown the reef up a distance of 76 feet on the south side so that the Main Reef series is, here, exactly opposite the South Reef series. At the bottom of the particular stope in which these pebbles occur, and at the contact of dyke and reef, on the north side of the former, the dyke is altered for a thickness of about 3 inches into a light bluish gray clay decomposition product. At, and for some 20 feet up from, the dyke contact, the shale underlying the Main Reef Leader is changed into a yellow, brittle, flakey porcelainite; above this it gradually assumes its ordinary character. A few pebbles of pyrites occur at the immediate contact of dyke and reef and for about 10 feet up from the dyke; above that they are then of frequent occurrence right up to the top of the stope. This stope 4 B.W.E. (N.O.D.) is between the 600 and 700 feet levels, the latter being 630 feet vertically below the surface. The length of the stope is about 130 feet, and it dips at an angle of about 38 degrees. It is one of the richest portions of the mine. For the last nine months of 1905 it averaged 22·8 dwts. over 21¼ inches of reef, or 12·4 dwts. over a stoping width of 39 inches, and for the first six months of 1906 it averaged 20·0 dwts. over 22·5 inches of reef, of 10·7 dwts. over a stoping width of 42 inches. Almost the whole of the gold is contained in the narrow band of conglomerate in which the pyrite pebbles occur; for example, during the first six months of 1906 the Main Reef Leader averaged 41·6 dwts. over 9·1 inches, while that portion of the Main Reef which was stoped only averaged 5·4 dwts. over 13·4 inches, the two together thus averaging 20·0 dwts. over 22·5 inches of reef. This band is known as the Main Reef Leader, and here averages between 9 and 10 inches in width. It is underlain by a thin but very persistent band of shale, which averages, in this stope, about 2·8 to 3·5 inches in thickness. Small stringers of quartz, running parallel to the bedding, occur here and there in this shale band, affording evidence of the action of mineralizing solutions. Immediately below this band is the bed of conglomerate known as the Main Reef which in this mine varies from about 10 to 15 feet in thickness; except occasionally, in places, it contains only a little gold. In mining the overlying Main Reef Leader a portion of the Main Reef is also extracted, it being impossible to carry the stopes sufficiently narrow to deal only with the Main Reef Leader. Similar pyrite pebbles are also occasionally met with further away from the dyke, on the western face of the stope, as also in the stope immediately below. The dyke is here about 40 feet wide, and passes through the lower end of the stope. It strikes approximately 16 degrees north of east and south of west, is almost vertical, dipping about 88 degrees north; can be traced throughout the mine, that is for a distance of about 3,000 feet, and extends westward into the Langlaagte Estate mine. Its average width in the Crown Reef mine is about 35 feet. To-day the quartzites and conglomerates of the Witwatersrand beds form an almost impervious mass, owing to the action of dynamic metamorphism, and to the deposition of secondary silica, and to a less extent pyrite and other secondary products, in the interstices of the original sandstones and conglomerates. Pressure exerted in a north and south direction has bent and folded the beds into their present position. This was accompanied by considerable fracturing, and consequently dyke intrusions; thus solutions, ascending through fractures and along lines of weakness produced by fracturing and the intrusion of these older dykes, would have encountered the beds in a sufficiently pervious condition to penetrate them. Presumably, in this particular case, the mineralizing solutions which deposited the iron disulphide, and probably some, if not all, of the gold, ascended along the line of fracture and weakness, produced by the intrusion of the dyke and spread out laterally near the surface, choosing one or more of the conglomerates as offering the easiest channels. Combined with its lateral motion, it would also have had a downward component due to gravity. As previously mentioned, the Main Reef Leader here immediately overlies a band of shale. This is fine and close grained, and its lines of stratification are parallel to the dip of the conglomerates. It thus forms a layer which is almost impervious to solutions circulating above it. Thus it is an easy matter to conceive how such solutions would naturally have concentrated above this layer, and might have precipitated some of their contents along its junction with the overlying and more porous conglomerate, especially as here the rate of flow would be somewhat lessened owing to the fact that the downward component of motion would be checked. If this is actually what happened, one would expect to find the majority of the pyritic pebbles at the immediate contact of the conglomerate with the underlying shale, and if there were any above this, that they would be less in number; and, this is how they actually do occur, and I have not found any pyrite pebbles below this shale band. The pebbles vary in size up to about 1 inch in length, they are mostly circular, but some are oval, and they are all well rounded. In cases where pebbles have been fractured, they sometimes show an internally radial fibrous structure, which of itself is sufficient evidence that they have been formed *in situ*. Further, the fact that in some, the quartz of the original pebbles has not been entirely replaced, and in others the pyrite may be seen entirely surrounding the quartz, and, so to speak, eating into it, so that if the pyrite were removed what were undoubtedly originally smooth water-worn pebbles would present irregular fretted and corroded surfaces, is convincing evidence that they are pseudomorphs by replacement of the quartz of which the majority of the pebbles of the conglomerates are composed.

Further on Mr. Horwood writes:—

Because some of the pyrite pebbles exhibited radiate structure, Mr. Hatch apparently thought that the mere statement of his personal opinion that they were of concretionary origin was sufficient explanation of their presence. In my paper on the Crown Reef occurrence I pointed out that the pyrite pebbles do not all exhibit radiate structure, and that those which do might be concretions, or quite possibly pseudomorphs, as this structure may have been developed later owing to gradual molecular rearrangement. Later, in my treatise on the Rand banket, I pointed out that to state an opinion that the pyrite pebbles owe their shape to growth by accretion, or that they are concretions, proves nothing and merely leaves the problem where it was before. I then showed that this radiate structure is a later development, doubtless due to contraction. Mr. Hatch in criticizing my present paper stated that after the publication of the first edition of the "Geology of South Africa," written by G. S. Corstorphine and himself in 1905, they came across pyrite pebbles that showed no concentric or radiate structure and were curiously flattened or of ellipsoidal shapes; they admitted that these certainly recalled the appearance of true pebbles, and that the possibility of these being pseudomorphs after quartz pebbles suggested itself, but remained a mere supposition until proved by the careful microscope work of R. B. Young, which was embodied in a paper read before the Geological Society of South Africa, on March 18, 1907.

The Sheba in September.

The Sheba crushed 6,780 tons, yielding 2,840 ozs., at an estimated profit of £3,656.

Glynn's Lydenburg.

The quarterly report of the Glynn's Lydenburg states, *inter alia*, that work was commenced on the lower section of South Hill to prove the ground between the South Hill workings and the western slope of the hill. So far, nothing of a payable nature has been met with. Werf Mynpacht: Electrically-driven pumps have been installed in drives 3 B.E.S. and 5 E.S., and driving south has been continued on reef in both drives. The reef in 3 B.E.S. is still dipping south, and, owing to the ground being saturated with water, which disintegrates the dolomite, progress here is difficult and slow: better progress was made with 5 E.S. when, after dipping south a short distance, the reef turned practically flat. No. 2 west drive has advanced to 1,094 ft. from the main drive, only 20 ft. of payable reef being exposed for the quarter. Prospecting claims: All work has been stopped on these claims and the option has been abandoned. The plant has been maintained in good order, and the work of rearranging the settling tanks has been completed, making provision for the treatment of a larger tonnage with fewer natives. Native labour has been plentiful throughout the quarter.

Meyer and Charlton.

The report for the quarter ended 30th June, 1914, is as follows:—Mine.—Number of feet driven, sunk and risen, 1,191 feet; footage sampled on reef, 835 feet; average stoping width, 49.02 inches; average assay value over stoping width, payable (595 feet sampled), 24.66 dwts.; low grade (240 feet sampled), 1.88 dwts; ore mined, 46,998 tons; less waste ore discarded (5.60 per cent.), 2,632 tons; ore sent to mill, 44,366 tons. Mill.—During April, May and June 75 stamps and 2 tube mills ran 85.58 days; ore crushed (total tonnage), 44,386 tons; duty per stamp per day, 6.91 tons; yield in fine gold, 10,876.09 ozs.; yield per ton, 4.90 dwts. Cyanide Works.—Sands and slimes treated (equal to 98.97 per cent. of tonnage crushed), 43,930 tons, yield in fine gold, 13,575.27 ozs.; yield per ton treated, 6.18 dwts.; yield per ton o(n basis of tonnage milled), 6.12 dwts.; working cost per ton treated, 2s. 2.35d. Total Yield.—Mill: 10,876.09 ozs. fine gold (4.90 dwts. per ton milled); cyanide, 13,575.27 ozs. fine gold (6.12 dwts. per ton milled); clean-up of concentrate plant, 269.66 ozs. fine gold (0.12 dwts. per ton milled); total, 24.721.02 ozs. fine gold (11.14 dwts. per ton milled). Expenditure and Revenue on basis of tonnage milled (44.386 tons).—Expenditure, £37,628 8s. 11. (16s. 11.46d. per ton); working profit for quarter, £66,245 7s. 8d. (£1 9s. 10.20d. per ton); total, £103,873 16s. 7d. (£2 6s. 9.66d. per ton); to balance, £67,390 7s. 8d. Note.—No allowance has been made in the above statement for the Government tax on profits. Expenditure on Capital Account.—On account of: Permanent works, £978 6s.; machinery and plant, £121 9s. 11d.; furniture, £3 15s.; total, £1,103 10s. 11d. The working profit for the quarter is £654 19s. 11d. in excess of that for the preceding quarter. The main incline shaft has been sunk 104 feet, and is now 181 feet below the 21st level. The average development values represent the actual results of sampling, not allowance having been made for any reductions which may subsequently be considered advisable when compiling the ore reserves.

Correspondence and Discussion.

Comments on Questions Arising in Technical Practice or Suggested by Articles in the Journal—Views, Suggestions and Experiences of Readers.

New Light on Rand Geology.

To the Editor, *South African Mining Journal.*

Sir,—In 1910 I published a short treatise on the Witwatersrand system, and later joined in the discussion in the Geological Society of South Africa on Dr. Mellor's later papers read before that society. During the time that has passed since then further study of the subject and many new facts which have come to my knowledge have led me to the conviction that in one important area my previous conclusions were at fault in that they did not go far enough. The area in question is that which extends from the Grey's Mynpacht to the South Randfontein Deep. That is to say, the area in which are found the Botha-Randfontein series and the Battery Reef series. I am now convinced that these series are the West Rand extensions of the Langerman's Kop, Rietfontein, Van Ryn-Modderfontein formations of the Central and Far Eastern Rand, which I place much lower in the Witwatersrand system than the Main Reef series of the Rand now being worked between Roodepoort and Boksburg. My reasons for this conclusion are as follows:—(1) The similarity of the sequence of the beds of this area of the Far West Rand (Botha-Randfontein) with that of the beds of the Far East Rand (Van Ryn-Modderfontein). (2) The close agreement in the thickness of the intervening strata between the Battery Reef series and the Botha's Reef series with that between the so-called Kimberley series of the Far East Rand and the Van Ryn series. (3) The great similarity of the material of which the beds are made up in the Botha's Randfontein Battery Reef area with the material of the Langermann's Kop, Rietfontein and Van Ryn-Modderfontein beds. (4) The marked similarity of the mineralisation of the banket beds in all these areas. (5) The marked dissimilarity and disagreement in every one of these respects (1 to 4) with the beds of the Main Reef series and the Kimberley series of the Roodepoort-Boksburg area.—Yours, etc.,

W. BLELOCH.

Helping the Trade of the Enemy.

ENGINEER'S PLEA FOR A STRAIGHT FIGHT.

To the Editor, *South African Mining Journal*

Sir,—In view of the general dissatisfaction with the lenient policy of the Imperial Government (also adopted by the Union Government) towards "enemy trade," may I ask you to print the following forcible but commonsense plea by a writer in the *Engineer*, which I commend to all your patriotic readers. The passage is as follows:

> When all is said and done, the whole tenour of the latest proclamation is wrong, and the fundamental iniquity in it is that it refuses to recognise German traders in this country as "enemies." And yet these are by far the worst type of trade enemy that Great Britain has. But for them and those trading in the other parts of the Empire Germany's foreign trade would not be worth talking about. The manufacturers in Germany could do nothing without these men in times of peace, and that the British Government should maintain and encourage them in time of war is so terrible a menace to British interests that it must be stopped. It *must* be stopped. How is it possible that we, as manufacturers, can allow ourselves to fall in with a scheme for maintaining the goodwill of our German competitors during the war so that that goodwill may and will be used against us the moment the war is over? What is the use of killing Germany politically if we are to nurse her industrially and commercially? As above stated, there are two ways open to our business people to put a stop to this. They must either rise up in their combined strength and compel the Government to modify its policy or they must themselves ascertain the conditions of the various alien enemies trading in this country, issue a "Black List" containing the names of those individuals and firms who are distinctly undesirable, and pledge themselves not to deal in any way with any of them, whatever the Government's view of such individuals or firms may be. There is no reason whatever why, because the Government says that you *may deal* with such and such a firm, you *should do so* if you do not wish to. If, therefore, buyers and sellers in this country refuse to do so the business of such firms will be killed except in so far as British Government contracts are concerned. It would be preferable, of course, for the manufacturers to bring the Government to see the error of its ways, and this can be done if all the engineering associations and the individual manufacturers, backed up by the technical Press of the country, will bring their weight to bear to make the Government study their interests. The co-operation of the trade unions should also be invoked and ought to be forthcoming, for the working men of the country will be the greatest sufferers of all if we are, during the war, to prop up those German concerns that have done them so much harm in the past. It is inconceivable that the Government, if approached by master and man throughout the country, will turn a deaf ear to so vital a matter. I attribute the present policy of the Government purely to that fundamental ignorance of trade matters of which, until recently, it was the habit of the ordinary British official to boast. That the various departments are now collaborating with the Board of Trade "to help British firms to obtain Germany's trade" shows that they mean well. But the publishing of a few belated statistics of what Germany is doing will not help us to take over her trade when the Government is doing everything in its power to help Germany to retain it. The truth of the matter is that the Government does not know how to act in the matter, and the manufacturers and the men must teach it.—I am, etc.,

"ENGINEER."

MINING MEN AND MATTERS.

Mr. James Whitehouse has returned to the Village Deep.

* * * *

Mr. Chas. Marx, Junr., has been appointed Assistant Manager of the State Mines.

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Mr. J. Craig, of the Consolidated Gold Fields, has returned to the Rand from his visit to Europe.

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The many friends of Mr. Wm. Pott will be glad to hear he is making a rapid recovery from his recent severe accident.

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Mr. C. E. Knecht, Consulting Engineer of the Consolidated Mines Selection, has resumed duty after a six months' holiday.

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Mr. Ralph Stokes, formerly well known on the Rand, and now Assistant Consulting Engineer with Mr. W. W. Mein, to the Canadian Mining and Exploration Co., has joined the Royal Engineers.

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Mr. Owen Letcher, of the editorial staff of this paper, joined the I.L.H. on mobilization, and is now with the forces in German South-West Africa, where his experience as a big game hunter should stand him in good stead.

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Some important papers were read at the monthly meeting of the S.A. Institute of Engineers the other evening, and interesting discussions took place on some controversial subjects. A report of the proceedings will appear in our next issue.

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Major the Hon. W. L. Bagot, D.S.O., of the Victoria Falls Power Co., was given a magnificent send-off from Park Station on Thursday morning, when he left by the Cape train on his way to rejoin his regiment, the Grenadier Guards.

THE CYANAMIDE INDUSTRY AND ITS SIGNIFICANCE.

Possibility of Making Cyanide From It By Adding Carbon.

The factories of the American Cyanamid Company at Niagara Falls, Ontario, which began operations in January, 1910, have an obvious interest for the Rand to-day. The original plant had an output of 12,000 tons a year, but this was increased during 1912 to approximately 32,000 tons a year, and further extensions are under way to give an annual output of 65,000 tons. From the commencement of operations it was clear that a plant producing 12,000 tons per annum was unable to meet the market requirements, but the directors of the company adopted the policy of thoroughly proving the commercial practicability of and demand for cyanamide before building a large plant. After two years, they realized that the product could be looked upon as an undoubted commercial success, and it was necessary to double the existing plant in order to cope with the increasing orders. Cyanamide is a bluish black, odourless material, containing from 18 per cent. to 20 per cent. ammonia, about 12 per cent. carbon and the equivalent of about 70 lb. of slacked lime. The material is shipped in burlap bags, and can be stored indefinitely. Cyanamide nitrogen is readily soluble; 95 per cent. will dissolve in cold water, and is, therefore, available as plant food. On contact with the soil, it reacts quickly and forms first urea, and then changes into double ammonium compounds. Every 100 lb. of cyanamide contains the equivalent of about 70 lb. of slacked lime, which adds considerably to its value as a fertilizer. The manufacture of cyanamide depends upon the chemical fact that calcium carbide at a high heat combines with atmospheric nitrogen and forms calcium cyanamide. Calcium carbide is made by fusing together lime and coke in an electric furnace. The carbide is placed in the ovens heated by electricity to white heat and nitrogen is led into the ovens and there combined with the carbide, forming calcium cyanamide. After cooling, the cyanamide is ground, treated with water and put through a mechanical finishing process. Before the installation of the cyanamide plant at Niagara Falls, a matter of importance was to determine the kind of reducing gas to be used in the preparation of nitrogen. After careful consideration, a coal-gas plant was decided upon, as the entire output of coke could be used in the manufacture of calcium carbide, and the coal gas gave the greatest amount of carbon content for use in the nitrogen ovens. The nitrogen ovens consist of a series of vertical retorts heated by small individual furnaces. Copper oxide is packed in these retorts, and when brought to the proper temperature, air is forced through them. The oxygen combines with the copper as cupric oxide, leaving the nitrogen free. The air is then shut off and as the oxide has gradually become foul during this cycle, coal gas is then passed through the retort, which acts as a reducing agent. The nitrogen is then forced through pipes into the electric furnaces where it combines with the calcium carbide and forms calcium cyanamide, or commercial cyanamide. The plant for the manufacture of lime to be used in the cyanamide plant was designed and installed by the Improved Equipment Company. The original plant consisted of six Doherty-Eldred lime kilns equipped with the Eldred process, and induced draft. The present plant consists of 12 kilns. While the nitrogen in the original plant and the 1912 extensions is being produced by the copper oxide process, the nitrogen in the 1913 extensions is being produced by the liquid air process. Three complete sets of Claude liquid-air nitrogen apparatus, manufactured by L'Air Liquide, Paris, are used. They operate at a pressure of [illegible] lb. per sq. in. and a temperature of minus [illegible] deg. F. The nitrogen is delivered at a purity of about [illegible] per cent. The oxygen in this product seldom reaches 0·1 per cent. The coke and gas plant, which has a capacity of 500,000 cu. ft. per day, was also installed by the Improved Equipment Company. In the past, the efforts of the manufacturers have been directed toward simplifying and cheapening the manufacturing process and improving the product for use as a commercial fertilizer, since there has always been a ready market for the entire production for fertilizer purposes. There are, however, a number of other ways in which the product may be used. It is well known that when calcium cyanamide is fused in the presence of carbon and a suitable fluxing agent, it is converted to cyanide. The crude product known as surrogate, may be used directly for cyaniding gold and silver ores, or it may be treated to recover the cyanide in a purer form. In the original Castner process for the manufacture of sodium cyanide, ammonia gas is absorbed by sodium at 400 deg. C., with the formation of amide and liberation of hydrogen.

$$NH_3 + Na = NH_2Na + H$$

When melted with one molecule of sodium cyanide, the amide is converted into sodium cyanamide between 550 deg. and 600 deg.

$$NH_2Na + NaCN = CN_2Na_2 + H_2$$

Cyanamide, when mixed with carbon and heated to 750 deg. to 800 deg., combines with the carbon to form cyanide. The use of intermediary molecules of cyanide may be avoided by proceeding in a different manner, using a first carbon atom to convert two molecules of amide into sodium cyanamide, and later, at 800 deg., a second atom of carbon to produce cyanide.

$$2\ NH_2Na + C = Na_2CN_2 + 2\ H_2$$
$$Na_2CN_2 + C = 2NaCN$$

The usual methods of cyanide manufacture make use of sodium as the alkali, while commercial cyanamide uses calcium, but there is no reason to believe that the latter is any less efficient than the former for metallurgical purposes when the same quantity of cyanogen is present. Hardening and cementing powders constitute a second class of cyanide derivatives of importance. These all contain cyanamide at the nitrogen basis. The hardening powders are used in the same way as cyanides, burnt leather, etc., for case-hardening. The cementing powders are used for making cement and blister steel. Another class of derivatives consists of certain compounds used in explosives. The principal members of this class are dicyandiamide, guanadine, nitro-guanadine, guanadine nitrate and ammonium nitrate. Urea, which, as well as dicyandiamide, is used in the dye industry, may also be derived from cyanamide.

£30,000 for Hospital Ship.

In connection with the Transvaal Chamber of Mines' gift to the Union Government of £30,000 for a hospital ship, or other purpose, the following is a text of the correspondence which has passed between the President of the Chamber and the Prime Minister:—

September 26: From President of the Chamber to the Prime Minister:

Sir,—I beg to inform you that the Executive Committee of this Chamber has the honour to offer to you as a gift from the mining companies, members of this Chamber (exclusive of the J. B. Robinson group companies), a sum of £30,000 towards the provision of a hospital ship or other facilities for the treatment of sick and wounded in the campaign in German South-West Africa, or for any other similar relief purposes at your discretion.—(Sgd.) E. A. WALLERS.

General Botha replied on September 30:—

Sir,—I have the honour to acknowledge the receipt of your letter of the 26th inst., informing me of the offer by the executive members of your Chamber as a gift from the mining companies, members of the Chamber, the sum of £30,000 towards the provision of a hospital ship or other facilities for the treatment of sick and wounded in the campaign in German South-West Africa, or for any similar relief at my discretion. On behalf of the Government and people of the Union I want to express great appreciation of the generous and patriotic gift of the mining industry. I am now considering how these moneys can most suitably be applied, and a further communication will be addressed to you in due course. Meanwhile I shall be glad if you would inform your Executive Committee that I accept the gift with grateful thanks."

Afrikander Annual Meeting.

The annual meeting of the shareholders in the Afrikander Proprietary Gold Mines, Ltd., was held last week in the board room of National Bank Buildings, Colonel W. Dalrymple presiding. In moving the adoption of the report and accounts for the year, the Chairman reviewed the steps taken to meet their financial responsibilities. Dealing with the new shares scheme, he said: "A guarantee agreement was entered into with several of the larger shareholders, providing for the underwriting of the new shares at 20s. each, without cost to the company. At the same time the agreement provided that all the shareholders have the right to subscribe for their pro rata of the shares; hence the guarantors only take up any balance of shares not applied for by the shareholders. It was intended to issue the new shares during August, but owing to the war a postponement of the issue become necessary, as shareholders might have been prejudiced had the issue been made on the date contemplated. Under the circumstances we have to thank the bankers of the company for allowing the debt to remain in abeyance for the time being. The guarantee agreement has been extended for a period of three months, and the issue of the shares referred to will be made as soon as circumstances allow. The report and accounts were adopted. Colonel Dalrymple and Mr. H. A. Rogers were re-elected directors. Messrs. F. W. Diamond & English were reappointed auditors.

MICROSCOPE FOR SALE.

Pillischer, London. Used under dozen times. Objectives 2, 1, ½, ¼ and 1/10 in., condensers, etc. Cost 36 guineas, sell 18 guineas. Reply, "MICROSCOPE," c/o "S.A. Mining Journal," Box 963, Johannesburg.

MINING INSTITUTE.

TEACHING CENTRES:— { JOHANNESBURG AND SCHOOL OF MINES, KIMBERLEY.

Prof. YATES prepares candidates for the following Government Certificates:—
MINE MANAGER'S. MECHANICAL ENGINEER'S.
MINE OVERSEER'S ELECTRICAL ENGINEER'S.
MINE SURVEYOR'S
by Class Private Tuition, and Correspondence.

SOME 1914 RESULTS:—
MANAGERS - - - January and May - - ALL Passed.
ELEC. ENGINEERS - February - - - - 66% ,,
MECH. ENGINEERS - June (Kimberley Centre) - - ALL ,,
MINE OVERSEERS - - - - - Practically ALL ,,
NEARLY 200 SUCCESSES. St. James' Mansions, Eloff Street.

THE SEPTEMBER GOLD OUTPUT IN DETAIL.

Just Under Three Millions—Improving Native Labour Force.

Total output	702,170 ozs.
Value	£2,982,630
Decrease	9,748 ozs.
Value	£41,407
Witwatersrand	677,063 ozs.
Value	£2,875,983
Decrease	7,544 ozs.
Value	£32,042
Outside Districts	25,107 ozs.
Value	£106,647
Decrease	2,204 ozs.
Value	£9,365
Total stamps	9,795
Decrease	24

The decrease in the total value of the September output (£41,407) compares with a decrease of £87,361 in August and an increase of £61,840 in July. The number of natives employed at the last day of September by the W.N.L.A. and contractors was 169,619 on gold mines and 9,389 on coal mines. In August the figures were 168,831 and 9,485 respectively.

INDIVIDUAL RETURNS.

The following is our usual monthly table:—

THE WITWATERSRAND.

	Ounces.	*Value.*
Aurora West	4,230	£17,968
Bantjes Consolidated	6,163	26,179
Brakpan Mines	17,392	73,876
City and Suburban	11,304	48,016
City Deep	20,319	86,310
Consolidated Langlaagte	15,015	63,779
Consolidated Main Reef	8,794	37,354
Crown Mines	58,329	247,766
Durban Roodepoort Deep	8,310	35,299
Durban Roodepoort	3,515	14,931
East Rand Proprietary	53,597	227,665
Ferreira Deep	22,241	94,474
Geduld Proprietary	9,025	38,336
Geldenhuis Deep	14,204	60,335
Ginsberg	3,898	16,558
Glencairn	3,541	15,041
Knight Central	6,929	29,433
Knights Deep	18,205	77,330
Langlaagte Estate	14,088	59,842
Luipaardsvlei Estate	4,823	20,487
Main Reef West	5,985	25,422
May Consolidated	2,120	9,005
Meyer and Charlton	7,773	33,017
Modderfontein B.	15,805	67,135
New Goch	7,464	31,705
New Heriot	5,627	23,902
New Kleinfontein	16,058	68 210
New Modderfontein	22,427	95,264
New Primrose	5,716	24,280
New Rietfontein	1,676	7,119
New Unified	3,256	13,831
Nourse Mines	14,975	63,609
Princess Estate	6,607	28,065
Randfontein Central	58,690	249,299
Robinson	20,694	87,902
Robinson Deep	16,994	72,186
Roodepoort United	6,034	25,631
Rose Deep	16,539	70,253
Simmer and Jack	15,974	67,853
Simmer Deep	10,960	46,555
Spes Bona Tribute	1,184	5,029
Van Ryn	11,369	48,292
Van Ryn Deep	16,508	70,121
Village Main Reef	15,090	64,098
Village Deep	17,091	72,598
Vogelstruis Estates	3,386	14,383
West Rand Central	843	3,581
West Rand Consolidated	7,814	33,192
Witwatersrand	12,178	51,729
Witwatersrand Deep	13,465	57,196
Wolhuter	9,603	40,791

OUTSIDE DISTRICTS.

HEIDELBERG—		
Nigel	3,052	12,964
Sub Nigel	2,054	8,725
BARBERTON—		
Barrett Gold Mines	326	1,384
Sheba	2,840	12,063
Worcester Exploration	1,103	4,685
KLERKSDORP—		
Quest	619	2,629
LYDENBURG		
Ceylon Lydenburg	237	1,007
Glynn's Lydenburg	1,873	7,956
Transvaal Gold Mining Estates	8,238	34,993

YEAR'S OUTPUT TO DATE.

Subjoined are the figures of the output from the beginning of the present year:—

	Ozs.	£
January	651,753	2,768,470
February	626,261	2,660,186
March	686,801	2,917,346
April	688,877	2,904,924
May	720,229	3,059,540
June	717,926	3,049,558
July	732,485	3,111,398
August	711,918	3,024,037
September	702,170	2,982,630

Nigel G.M. Co. in September.

The Nigel Gold Mining Company had 55 stamps in operation; 9,350 tons were milled and the gold recovered was 3,052 ozs. Owing principally to the small tonnage milled, suspension of the treatment of accumulated sands in order to husband cyanide, and high residues caused by impure water, expenditure for the month exceeded revenue by £1,260,

Springs Mines.

Of the footage sampled during the quarter at the Springs Mines, 58 per cent. was in payable areas and averaged 25·2 dwts. over 26 inches. A similar analysis of the total development to date shows 52 per cent. of payable footage averaging 19·6 dwts. over 25 inches. The reduced footage accomplished during the quarter (2 966) was due to the closing down of the north shaft early in August, this step having been decided on in consequence of the abnormal financial conditions arising out of the European war. The connection between the two shaft will consequently take longer than was originally anticipated, and there will be still further delay owing to a hard dyke having been encountered. This dyke has now been passed through, and it is expected that the connection will be completed before the end of November.

Brakpan Mines.

In the quarter ended the 30th of September the total working costs of the Brakpan Mines were £146,334 14s. 3d., or 17s. 6·327d. per ton milled. The revenue from gold won was £228,056 5s. 9d., or 27s. 3·785d. per ton. The working profit was £81,721 11s. 1d., equal to 27s. 3·785d. per ton milled.

Modder B.

The operations for the quarter call for no special comment, the mine and works running smoothly throughout. The recovery per ton milled was slightly lower than in the preceding quarter, but the profit realised was greater owing to an increase of 4,400 tons in the ore milled. Reef disclosures from development show little change; of the total, 1,102 feet exposed 15 inches of reef of an average value of 142s. 1d. per ton, the balance being of low grade. Construction work in connection with the extensions to plant proceeded satisfactorily, and the new stamps are practically completed. The capital expenditure for the quarter, mainly in connection with new equipment, amounted to £24,481, while the amount authorised still to expend is £17,342. The mine is sufficiently provided with stope room to furnish a larger output, but the native labour force will require strengthening before any material increase in tonnage can be looked for. An interim dividend, No. 4, of 25 per cent., was declared on the 9th of June, 1914, for the half-year ended with the 30th of June, 1914.

Engineering Notes and News.

"What the Scrap Heap Reveals."

In his last annual report the General Manager of the S.A.R. writes:—My attention has been directed to an article which appeared in an American publication on the question of "What the scrap heap reveals." The remarks are so appropriate that I commend them to the consideration of the officers of the S.A.R. Administration:—"If suitable records are kept and classified for a period of several years it is possible quickly and accurately to determine just what parts of equipment fail the most frequently. If records of this kind are not kept, then the scrap pile offers the next best opportunity for securing information as to the failure of the various parts. This is particularly true where conditions make it necessary to ship all the scrap which is to be sold to one central part of the system. For instance, when the Sante Fé established the scrap plant at Corwith, Ill., those in charge noticed that as the scrap was sorted out certain parts which were used on equipment that had only been on the road for a few years appeared in large numbers. Investigation showed that these parts had failed due to defective design, and the purchasing agent was therefore in a position to ask the builders to furnish new parts of a better design at no expense to the railroad, thus preventing the continuance of failures and resulting in a considerable saving."

S.A.R. Rolling Stock.

Twenty-six new 3 ft. 6 in. gauge locomotives, and two 2 ft. gauge engines were placed in service by the S.A.R. during last year (1913), in addition to which fifteen "Reid" engines were converted. Twenty four obsolete engines were scrapped, and eight engines were sold. The total number of locomotives on the books at the 31st December, 1913, was 1,458, of which 1,428 were 3 ft. 6 in. gauge and 30 were 2 ft. gauge. The average tractive force (75 per cent.) increased during the year from 21,103 lb. to 21,626 lb., while the number of engines of a tractive force of over 30,000 lb. increased from 190 to 216. A large number of the engines are of obsolete types, and are gradually being withdrawn from service. Nine "Class 14" and three "Class 4a" engines are now in course of erection, while 161 3 ft. 6 in. gauge and three 2 ft. gauge are on order; and, in addition, tenders have been invited for seven other locomotives. With the exception of the "Class 4a" engines, which are designed to work the heavy passenger traffic between Capetown and Touws River, the whole of the new stock was designed for use in the Natal Province and on the Witbank line. All the engines, with the exception of the narrow-gauge locomotives, six "Class J" and fifteen "Class 14b," are to be equipped with the "Schmidt" superheater. The mileage basis of lubrication of locomotives and coaching stock is proceeding satisfactorily (says the annual report of the General Manager), and with the increase of white metal in engine working parts and the use of mineral oil, which is now practically universal throughout the system, further economies are anticipated. The economies realized in the cost of lubrication of rolling stock have not been effected at the expense of the vehicles, as is evidenced by the gradual reduction in the number of hot boxes. It is also proposed to place orders for thirty-seven engines at a cost of £106,000, seventy-eight first and second class coaches, fifteen third class coaches, and two composite brake carriages, at a cost of £278,850, 914 trucks at a cost of £290,310, or a total expenditure of £675,160.

MINING EXAMINATIONS.

Private Individual Tuition for Mine Managers, Mine Captains, Mine Surveyors, Mechanical and Electrical Engineers, and Engine Drivers' Examinations. Practical Mathematics and Electrotechnics, Correspondence Lessons where personal tuition is impossible.

E. J. MOYNIHAN, Consulting Engineer, 35 and 36, Cuthbert's Buildings, Eloff Street, Johannesburg, P.O. Box 2061.

Electrical System of Dust Deposition.

It was known as early as 1824 that finely divided solid particles carried in suspension in the air could be deposited on a plate by means of a brush discharge from an electrostatic machine. In 1905-6, Prof. F. G. Cottrell, of the University of California, abandoned the static machine as a source of high-pressure direct current, and arranged to tap off the peak of the voltage wave from a high-pressure alternating-current circuit, thus securing a high-pressure unidirectional source of energy. This permitted the practical application of the process to sulphuric acid plants, powder works, cement plants, and smelters. At Riverside, Cal., 90 tons of cement dust per day are recovered from the flues of the Riverside Portland Cement Works by this process, with a power expenditure of only 35 kw. It is reported that the waste product recovered practically pays for the cost of operating the system.—*Electrical Review and Western Electrician.*

Accidents and Electricity.

The sectional report of H.M. Electrical Inspector of Factories, Mr. G. Scott Ram, included in the recent annual report of the Chief Inspector of Factories, contains not only instructive reading, but also some very critical comments upon existing conditions of working. At the same time, it is gratifying to learn that the number of accidents attending the use of electricity—when the extensive application of electrical energy is taken into account—are remarkably few; still it is somewhat disconcerting to be told that quite a number of accidents which occur are of a preventable nature. Thus, even in the case of medium-pressure switchboard work, thirteen accidents occurred in consequence of the use of ordinary engine-room spanners, pliers, etc., on live switchboards, and not one of these need have taken place had properly insulated tools been used.

Situations Wanted.

WANTED:

Position as COLLIERY MANAGER or ASSISTANT to same in Union of South Africa or Rhodesia. Advertiser holds such a position at present: with First Class S.A. qualification and three years' Transvaal mining experience, also practical knowledge of Oil Shale prospective development. Reply, "CARBON," c/o "S.A. Mining Journal," Box 963, Johannesburg.

WANTED.

MECHANICAL ENGINEER (Certificated) with fair knowledge Electricity and Gas Plants, wants engagement. Age 29. Several years' experience mine work. Reply "Certificated," *S. A. Mining Journal*, Box 963, Johannesburg.

WANTED.

SURVEYOR (Government Mine Surveyor's Certificate) seeks engagement in any position with mining house. 12 years on diamond fields and reef. Excellent references. Reply, "A.B.," c/o "S.A Mining Journal." Box 963, Johannesburg.

WANTED.

Position as Manager or Mine Captain by man holding Manager's, Overseer's and Surveyor's Certificates. Excellent testimonials. Rand and other experience. Reply, "Mine Manager," c/o "S.A. Mining Journal," Box 963, Johannesburg.

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SOUTH AFRICAN J. B. WHITE & BROTHERS SOUTH AFRICA **PORTLAND CEMENT**

Just as "White's" English Cement has been for more than 50 years past the Standard Brand in South Africa, so is "White's South African Cement" the Standard Portland Cement here now.

Guaranteed to comply with all the requirements of the British Standard Specification.

HIGHEST QUALITY.—COMPETITIVE PRICES.

THE WORKS ARE NOW READY TO DELIVER CEMENT. STOCKED BY ALL WHOLESALE HOUSES.

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P.O. Box 2484. Telephone 5766. Telegrams: "PORTLAND."

WORKS:
VENTERSBURG ROAD, O.F.S.

Steel Coaches for the S.A.R.

In his last annual report, Mr. D. A. Hendrie, Chief Mechanical Engineer of the S.A.R., writes:—The lessons derived from recent experience in serious railway accidents in Europe and America have concentrated attention upon the advantages of steel coaches, and I have been expending a good deal of thought on the matter, and, during my visit to Europe this year, it is my intention to inspect this type of coach. At this stage it will perhaps be instructive and prepare the way for solid consideration if I mention one or two of the advantages claimed:—Fireproof: The elimination of inflammable material in the construction of coaches is always a desirable aim. Sanitation: The coaches can be readily flushed after long, dusty journeys, and this provides a more healthy form of transport. If properly insulated with asbestos the carriages are warmer in winter and cooler in summer. Accommodation: The steel coaches give increased seating accommodation, and it is possible to obtain the maximum dimensions, and there is also a saving in weight. The same width over all would allow 3-in. longer sleeping bunks. Maintenance: I have no data on this point at present, but it is claimed that the cost of maintenance will be much reduced, which I can well believe. The scarcity of suitable materials, such as teak, is always an important consideration, and the steel design goes a long way to solve this.

Mechanical Transport for War Purposes.

Transport organisation for food, stores, and material will be an important, almost vital, factor in determining the issue of the conflict which is being waged throughout Europe; and for the first time the advantages and possibilities of mechanical transport on a huge scale will be brought to the test of actual experience during active and impetuous hostilities. Considerable value accordingly attaches to an article on the subject which appeared recently in the *Morning Post*, in which the writer, Mr. Horace Wyatt, not only discusses the general bearing of motor traction on problems of military transport in England, on the Continent, and in the Dominions, but also give considerable information on the systems which have been adopted, and the efficiency they have attained, in France, Germany, Austria, Russia, and Italy, which is of special interest just now. "All those countries which possess good road systems, and in which the trading community are able with advantage to employ substantial motor vehicles, prefer to meet their military needs by a scheme of subsidy rather than by direct purchase." The self-contained lorry has found most favour with the experts of the continental armies for three governing reasons: "It can be more easily manœuvred, . . . occupies much less road space, and can be safely driven at higher speeds." The industrial motor lorries are much more numerous in the thickly populated areas of the British Isles than in any of the continental countries. France has a much smaller number available than we have, Germany and Austria a still more limited supply: "in Russia and Italy the use of mechanical transport is only in its infancy. The two last-named countries consequently have to depend on direct purchase for military use"—a very costly business indeed. France and Germany require for the carrying out of their schemes of operations something over 6,000 motor lorries: and they "have been handicapped by the difficulty of persuading commercial concerns to purchase motor lorries, even when the enticement of a substantial subsidy has been offered." As a consequence they have had to depend on what is available, and anything like standardisation of type has been impossible, and may cause considerable difficulties during the operations of war.

Electrification of S.A. Railways.

The reports which have been made as a result of the preliminary inquiries instituted from time to time in regard to the electrification of the Union railways have been collated and are now receiving the consideration of the Administration. The extension of the application of electric traction on main lines of railway in America and Europe has been most rapid during recent years. A lecture was recently given by Mr. Philip Dawson, consulting electrical engineer of the London, Brighton, and South Coast Railway, in which striking evidence was afforded of the progress made in Europe and America. Mr. Dawson stated that in America the maintenance of steam locomotives varies from 5d. to 10d. per locomotive mile, whereas in connection with electric locomotives all over America these costs vary between 1·5d. and 2·5d. per locomotive mile. He also states that "The cost of operating electric locomotives, particularly where coal is expensive, is also much less than operating steam locomotives under average conditions." This evidence (remarks Mr. Hoy in his annual report) points to the advantage that would arise from the electrification of the Wynberg line in the Cape Peninsula. In referring to some of the heavier portions of track in America, Mr. Dawson states that the Norfolk and Western Railroad "is electrifying the heaviest portion of their track in the Allegheny Mountains of about 85 miles on which 25 of the most powerful locomotives will be used. The electric locomotives are to haul mineral trains of about 3,250 tons in weight on gradients of 1 in 50 at speeds of 14 miles per hour on the level." On the Baltimore and Ohio Railway there are nine electric locomotives in operation: they haul mineral trains of over 3,000 tons up gradients of 1 in 75, at speeds of 15 miles per hour. These results go to show that, providing electrical energy can be obtained at a reasonable figure, the problems with which the Administration is faced on certain sections of the Cape, Transvaal, and Natal are capable of solution. Additional capital expenditure would, of course, be involved, but judging from the results obtained in other countries, the advantages to be derived from reduced working costs, increased capacity of the line, and additional comfort in passenger travel, would be more than commensurate with the outlay. In Europe the progress of the electrification of main line railways has been quite as rapid as in America, as shown by the fact that in Europe at the present time there are about 2,000 miles of single track of main line electrified. The reports at present in the hands of the Administration are not so comprehensive as the subjects demands. Some of them were made as far back as 1903. Since then great advances have been made in the application of electricity to railway traction. As an engineering proposition the electrification of certain sections of the railways in South Africa is not open to doubt, and the points remaining to be considered are:—(a) Capital cost; (b) working expenditure; (c) choice of system; (d) section of line to be electrified. These are matters on which the Administration should secure the most eminent advice obtainable. I consider the time has now arrived when the services of a consulting electrical engineer who is acquainted with the subject of electrification of railways should be obtained; he should visit South Africa and study the local problems and conditions on the spot, and thereafter submit his report and recommendations. Steps should be taken to enable the Administration to avail itself of the advantages which experience in other countries has shown are to be derived from the adoption of electrification in the working of railways.

A Transvaal Colliery and the Navy.

The directors of the Uitkyk Collieries, Ltd., have received the following letter from the Admiralty:—"Gentelmen.—I am commanded by my Lords Commissioners of the Admiralty to inform you that they are pleased to accept the offer contained in your letter of the 21st August to supply, free of cost, 2,000 tons of best round coal from the Uitkyk Collieries, on rail at Uitkyk Station, Transvaal, for such use as the Admiralty may determine. 2. Particulars of your offer have been communicated to the Commander in Chief, Cape of Good Hope, who has been requested to arrange for its transit from Uitkyk Station to such destination as may be required. 3. I am to convey to you an expression of their Lordships' high appreciation of your gift, and of the spirit which has prompted you to make the offer.—I am, gentlemen, your obedient servant, (Sgd.) W. Graham Greene."

Hydraulic Classifiers and Classification.

Mr. G. A. Robertson, at the last meeting of the Chemical, Metallurgical and Mining Society, said:—"There is room for improvement in our present-day system of hydraulic classification on the Witwatersrand. That improvement is limited to (1) a saving in capital expenditure by the employment of shallow classifiers, shallow pits for tube-mills, and a low height of elevation of pulp; (2) lower working costs due to the handling of smaller quantities of sand in the tube-mill circuit; (3) to increased gold extraction. When a large number of mine reports show a gold extraction varying from 95 per cent. to 97 per cent. the improvement that can be made in classification in such cases is chiefly by reducing the tonnage of sand being fed to the tube mills. That does not necessarily mean an increased gold extraction, but may mean a longer life for tube-mill liners and pump liners, and a resultant lowering of working costs consequent on the handling of a reduced tonnage of sand in the tube-mill circuit. In some cases this may mean a reduction of from 300 to 400 tons per day down to 150 to 200 tons per day."

New Patents.

337. Charles William Dowsett.—Improvements in automatic regulator for cone classifier.
338. Urlyn Clifton Tainton.—Improvements in the electrolytic recovery of metals from their solutions and in apparatus therefor.
339. Adolph Landman Erasmus.—An improved windmill.
340. Sidney Thomas Hollingum and Harry Percy Rudd.—Automatic self-coupling buffer for use on railway rolling stock and the like.
341. Orenstein-Koppel, Ltd., and Martin Christensen.—Improvements in and relating to axle bearings for trucks and the like.
342. Charles Bennett. Improvements in the manufacture of bricks, tiles, slabs, blocks and the like.
343. Kenneth Bertram Lamont.—Improvements in securing collars or like parts to shafts.
344. The Vulcan Foundry, Ltd., and William Collingwood.—Improvements in or relating to riveting machines.
345. Jessie Clarke.—An improved dust collector for machine drills in use in mines.
346. Amos Ivan Addison.—Process of producing the combustion of hydrocarbons.
347. Moses Mittledorfer Marcuse.—Sanitary closets and the method of treating the deposits usual to the proper use thereof.
348. Arthur Eli Abrahams and George Klahn.—A self-opening gate.
349. Alwyn Jacobus Francis.—A new and improved method of automatically locking balcony gates of railway vehicles.
350. William Henry Humphries.—Bat roost.
351. Charles William Creswell Hine.—Improvements in or relating to buffer or other springs constructed with india-rubber.
352. Frank Picone.—Ore concentrators.
353. Seguin Fisher.—Improvements in percussive apparatus.
354. Orenstein-Arthur Koppel, Ltd., and Martin Christensen.—Improvements in tipping trucks and the like.
355. Frederick Victor William Swanton.—Improvements in power producing apparatus.

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COMPANY, LIMITED
(INCORPORATED IN THE TRANSVAAL).
ESTABLISHED 1892.

Largest and oldest established Manufacturers of Portland Cement in South Africa.
OUTPUT OVER ONE MILLION BAGS PER ANNUM.
Contractors to the Union Government, South African Railways, Johannesburg, Pretoria, Bloemfontein, Capetown, Durban and other important Municipalities, Irrigation Boards, Mining Companies, etc., etc.
"PRETORIA" PORTLAND CEMENT, QUALITY UNSURPASSED.
Every bag guaranteed to pass the full requirements of the British Standard Specification.
REMEMBER: Our guarantee is backed by over 20 years' experience of South African conditions

PROCURABLE FROM ALL MERCHANTS IN SOUTH AFRICA.

Finance, Commerce, and Industries.

Johannesburg and the War.

The effect of war on the building trade of Johannesburg was marked—£82,898 being the estimated cost for erecting new buildings, while last year £87,854 was spent. At the same time, the month's total was the record for this year. Municipal trading resulted as follows:—Electricity (units generated), for light and power, 1,426,355 (in September, 1913, 1,277,461); for traction, 592,415 (622,800). The total amount of power and light retailed to the public decreased by 291,150 units as compared with August. In the way of gas, 3,334,348 cubic feet were produced. This showed a drop of 819,352 cubic feet. During September, 2,365,283 passengers were carried on the trams, and 276,818 miles were run, and the receipts were £26,772 4s. 6d. As compared with the corresponding month last year, this reveals a loss of £1,196, the passengers being 133,000 in number, and the tram mileage 876 miles less. These hard times more people are walking. During the month fire damage was estimated at £4,572. In 1913 it was £1,622. Water was retailed to the extent of 83,583,900 gallons. Since 1910 this figure has only once been beaten—in December, 1913, when 86,672,700 gallons were sold. The livestock market's figures were quite satisfactory, the summary of animals passing through the authorities' hands showing an increase, while less meat was condemned and less imported.

* * * *

Galvanised Iron Exports Released.

The restraint on the export of galvanised sheets has not lasted long, says a London correspondent. To the intense satisfaction of the trade the prohibition has now been removed—or, as some makers prefer to read the order, been "relaxed." The reversal of the recent Government policy was almost a necessity if these large works were not to be entirely brought to a stand, so serious was the restrictive step. Galvanisers are now hoping for an autumn trade. The arrival of supplies of spelter from America has also contributed to give more elasticity to the market. These imports will be subject to the claims of the State, the first consideration being to ensure the ammunition supply and to provide the wire entanglements and the sheets required by the military for building and constructional purposes. When these requirements have been safeguarded there will be sufficient spelter, it is hoped, for general trade purposes. This week 24 gauge corrugated sheets were on offer on Birmingham Iron Exchange at £14 10s. for home or export. Galvanisers state that they are doing their best to meet the calls of regular export customers, but they are naturally not prepared, in the difficult position in which they find themselves, to neglect the opportunity which the situation offers them to get higher prices.

* * * *

The Question of Sleepers.

Considering that a large proportion of the sleepers for the Union Railways comes from Australia, the S.A.R. Administration obtains its supplies on terms which compare very favourably with the large contracts recently entered into by the Commonwealth Government for material for the Trans-Australian Railway. Writing in regard to the Powellizing of sleepers, the Chief Railway Storekeeper says:—"There are two opinions about the Powellizing of sleepers. One is that it very considerably increases the life of the timber, but this to my mind cannot yet be borne out by actual experience. The other opinion is that Powellizing does not establish all that is claimed for it. Apart from all this we have had Karri sleepers in this country before and this timber has always with us shown extremely poor results. Both these views considered, I am not prepared to recommend the use by the Administration of Powellized Karri sleepers." The Engineer-in-Chief agrees that the Administration should not experiment with Powellizing until practical experience has conclusively proved this treatment to be a success. A large number of steel sleepers are also being purchased for the Trans-Australian Line, and in this connection the Engineer-in-Chief of the Union Railways report that he is anxious to experiment largely with the Administration's new standard steel sleepers, the design of which has been highly spoken of by certain of the highest experts in sleeper manufacture, who are confident of its success.

* * * *

Papyrus from Zululand.

The following is a condensed report by the Director of the Imperial Institute supplied to us by the Union Department of Agriculture:—The Department of Commerce and Industries submitted to the Imperial Institute a sample of papyrus from St. Lucia Bay, district of Zululand, for the purpose of ascertaining its value for paper-making. The following is an abridgment of a report received from the Director of the Institute:—The sample weighed 9 lbs., and consisted of greenish-yellow pithy stems, averaging 7 feet in length and about 1 inch in diameter at the base. Each stem bore at the top a tuft of narrow, pointed leaves, about 14 inches long. The entire sample consisted approximately of stem 80 per cent. and leaf-tufts 20 per cent. The series of experiments were carried out with the papyrus at the Imperial Institute, employing (1) the whole stems, including the leaf-tufts, and (2) the stems only, the leaf-tufts being removed. The yield of pulp and the average length of the ultimate fibres were slightly less in the case of the stems and leaves than when the stems only were used, but the differences are so small as to be practically unimportant. 1911: 359,645 tons, value £2,745,620; 1912: 401,597 tons, value £3,147,086; 1913: 395,305 tons, value £3,253,190. Anyone desiring more detailed information will be supplied with the full report furnished by the Imperial Institute.

* * * *

S.A.R. in 1913.

The report of the General Manager of Railways and Harbours for the year 1913 has been issued. Discussing the volume of traffic, Mr. Hoy points out that there was an increase as compared with 1912 in the number of passengers carried of 1,757,731, or 4.24 per cent., and in the passenger receipts of £68,896, or 2.08 per cent. The gross tonnage of revenue-earning traffic showed an increase of 654,928 tons, or 5.58 per cent., but the goods receipts showed a decrease of £188,534, or 2.03 per cent. These figures illustrated the effect of the rates reductions introduced in 1912. The increase of 2.44 per cent. in the passenger receipts was not in the same proportion to the increase in the number of passengers carried, while in the goods traffic, though there was an increased tonnage of 6.19 per cent., the receipts decreased by 2.03 per cent. Having regard to the industrial troubles and the season of drought in 1913 it was satisfactory that the tonnage of traffic and the number of passengers carried should show an improvement. The report, which is dated the 29th of May, 1914, discusses the strike of January last, and Mr. Hoy seeks to show that the strike was quite groundless. A tribute is paid to the men who stood loyally by the Administration.

* * * *

British Westinghouse Company.

The hopes entertained in certain quarters at the commencement of the European War that the British Westinghouse Company would secure contracts which otherwise would have been given to German manufacturers have been speedily fulfilled, and it is now common knowledge in Manchester that a large volume of remunerative work has been secured by the English undertaking on terms which should yield a handsome profit after allowing for some increase in working expenses. The progress of the British Westinghouse Company during recent years has been rapid and unbroken, and it would have been much greater but for the bugbear of German competitors. In order to cope with these it has been necessary to cut prices to an extent which has sometimes left little, if any, profit. Now, however, that this factor in the situation has disappeared, the company is able to obtain as much business as it can handle on excellent terms. The Board are, therefore, considering the question of developing the business in various directions where there appears to be a promising opening, and the scope of the company's operations is likely to be very much enlarged during the next twelve months. Not only so, but the new departments are intended to rank as an important addition to the existing business. It is understood that there are no difficulties in the way of financing the directors' schemes, provision having already been made for this.

* * * *

" S.A. Mining Journal " Exchange. With the Stock Exchange closed, it has been represented to us that the time is opportune to offer facilities in our advertising columns for the purchase and sale of securities for cash. No speculative dealings, of course, are ever possible through the *S.A. Mining Journal* Exchange. But sellers who desire money for securities they hold, and buyers who desire securities at the present low prices, and are prepared to pay cash can usefully avail themselves of the *S.A. Mining Journal* Exchange. Write stating name of stock or share, the amount and the price required, together with a postal order for 5s. for each item announced, with a stamped addressed envelope. Announcements should reach this office by 5 p.m. on Thursday of each week to ensure publication in that week's issue.

* * * *

The Egg Industry. The preservation and conservation of egg products is dealt with by Mr. W. O. John, Lecturer in Poultry, School of Agriculture, Elsenburg, C.P., in a circular supplied to us by the Department of Agriculture, from which we extract the following:—" South Africa is still dependent upon oversea countries to the extent of over 21,000,000 eggs per annum, valued at nearly £80,000. The countries from which in the past these supplies have mainly been drawn are now engaged in or affected by the greatest war in the world's history, and the nutritive value of eggs as a food for the sick and wounded is fully realised by the countries now at war; it is to be expected that, apart from difficulties of export under present conditions, such products as eggs and poultry will naturally be consumed to a very great extent in the countries in which they are produced. In the past this country depended chiefly on Italy, United Kingdom and Russia, for eggs to supply South Africa's needs during the scarce season. This supply is now largely cut off, and it behoves every South African poultry breeder, farmer and cottager to see that the shortage be made good within the Union. This can be done if only we take care of the egg crop, and do everything possible to prevent waste—it must be admitted that there is a tremendous wastage of eggs during the plentiful season. The price of this commodity is governed by the law of supply and demand, and this is the sole reason why eggs are sold at such ridiculously low prices. During the summer months eggs have become a glut on the market, hence the fall in price. Every producer should know how to conserve his produce or how to preserve it. The former is easy where cold storage is available, and the preservation of eggs could be carried out successfully in districts where the temperature is not too high, for after all preservation to be entirely successful is purely a question of temperatures, and very little can be done in districts where the room or cellar temperature is too high."

Intimation has been given by the Association of Chambers of Commerce of South Africa, stating that, in view of the conditions consequent on the war, it has been decided to postpone indefinitely the annual Congress, which was to have been held in Capetown, commencing on October 26 next.

New S.A. Companies Registered in London.

ELECTRO CHEMICAL COMPANY OF SOUTH AFRICA, LIMITED.

Particulars filed in London, September 7. Capital £2,000, in £10 shares. Registered in the Transvaal on March 29, 1911, to carry on the business indicated by the title, and to acquire any mines, mining rights, and metalliferous land in the Transvaal or elsewhere. British address: 13, St. Helen's Place, London, E.C., where E. H. Rainbow, J. A. Millington, and J. Websdale are authorised to accept service.

Competition with German and Austrian Trade.

The Commercial Intelligence Branch of the Board of Trade, at 73, Basinghall Street, E.C., are desirous of hearing from firms who are prepared to send to them samples or catalogues of German and Austrian or Hungarian goods which have competed with British products at home or abroad. The Board of Trade propose to hold an exhibition of samples of this nature, and would welcome the co-operation of British manufacturers and traders. Another of the Board of Trade's series of publications gives very full information respecting our enemies' exports of machine tools and some notes on the position in the different markets of the world for the use of firms interested in this branch of engineering industry. Yet another deals similarly with printing and lithographic machines. Pumps and pumping machinery are covered in a third pamphlet, and others are being issued.

The best " Reef Traveller " is the *South African Mining Journal.*

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TRADING WITH THE ENEMY.

Important Statement by the Treasury—Government's Policy—Proclamation Interpreted.

THE following letter from the Union Treasury has been addressed to the Johannesburg Chamber of Commerce, and at the request of the Secretary for Finance has been circulated to all Chambers of Commerce in South Africa:—

I have the honour, by direction of the Minister of Finance, to advert to the correspondence recently exchanged with your Chamber on the subject of trading in the Union by German and Austrian subjects. In my telegram to you of the 14th instant, I informed the Chamber that, in view of the impending publication of an amending Proclamation of His Majesty on this subject, it was necessary to defer the promised communication from this Department, conveying the Government's reply to your Chamber's deputation. The amending Procalmation appeared in yesterday's issue of the *Government Gazette*, and, accordingly, the Treasury is now in a position to implement the understanding with the deputation. As your Chamber will have observed, the new Proclamation revokes His Majesty's earlier Proclamation dealing with the subject of trading with the enemy, and indicates the policy of His Majesty's Government in relation to such matters. Moreover, the new Proclamation removes certain doubts regarding the interpretation of the original instructions on this subject.

GENERAL EFFECT OF PROVISIONS.

While the new Proclamation seems to be clear and explicit, it may not be out of place to give a brief indication of the general effect of its terms. The new Proclamation provides: (a) That, in so far as concerns the prohibition against trading with an enemy, German or Austrian subjects resident in British territory are not to be regarded as enemies. (b) That German or Austrian subjects resident in British territory are permitted to continue their trade or occupation, and may receive and dispose of goods or merchandise, provided such goods or merchandise were not acquired by them by contract with an enemy made after the outbreak of war. At the same time, nothing in the Royal Proclamation contained limits or impairs in any respect the freedom of the military authorities in this or any other part of the Empire to require German or Austrian subjects to conform to any disposition that may seem necessary for the effective prosecution of military operations or the preservation of the public welfare. Nor does the Royal Proclamation limit in any respect the discretion of the Government of any part of the Empire in the matter of taking any measures that may seem to be expedient for supervising any restricting trade by German or Austrian subjects, in order to secure that they hold no commercial intercourse, direct or indirect, with enemy territory, and for any other purpose deemed expedient in the public interest, *e.g.*, for the protection of British creditors.

WHAT "ENEMY" MEANS.

Reverting now to the Chamber's questions embodied in your letter of the 26th ultimo, the new Proclamation makes it clear: (a) That it is quite competent for British subjects or firms in the Union to continue to trade in the ordinary way with German or Austrian subjects or firms resident or carrying on business in the Union; provided that the goods or merchandise so traded in have not been acquired by contract with an enemy made after the outbreak of war. (It will be noted from the Proclamation that the expression "enemy" means any person resident or carrying on business in any of the territories of the German Empire or of the Dual Monarchy of Austria-Hungary.) (b) It follows from (a) that there is nothing to prevent British subjects or firms in the Union from making payments to German or Austrian subjects or firms resident or carrying on business in the Union in respect of contracts made prior to the outbreak of war. (c) Save as may be decided in connection with any such measures as may be taken by the Union Government in the exercise of the powers mentioned in paragraphs 5 and 6 of this letter, it is not necessary for a German or Austrian firm to obtain permission from the Government to continue trading here; provided, of course, that the articles of trade were not acquired by contract with an enemy made after the outbreak of war. Generally, the policy of the Union Government in regard to trading with the enemy will be in harmony with that pursued in the United Kingdom. As arranged with the deputation from your Chamber, the Minister of Finance caused inquiries to be made as to the attitude of His Majesty's Government in relation to the aspects of this question put forward by the deputation.

CONSIDERATIONS OF SELF-INTEREST.

As a result of these inquiries, it appears that, in adopting the policy indicated in the new Proclamation and summarised in this letter, the Imperial authorities have been actuated, not by motives of toleration or solicitude for German or Austrian subjects carrying on business in British territory, but solely by the widest considerations of self-interest. These German and Austrian subjects employ British labour, they occupy property belonging to British subjects, and in other directions the carrying on of their businesses contributes to the welfare of the community; and it is recognised that, while benefit to individual British subjects may flow from a policy of restricting trading by German or Austrian subjects, the aggregate of these benefits is insignificant in comparison with the loss inflicted by such policy on the community at large. In conclusion, I am to express the hope that this letter may achieve its object of setting at rest the doubts which your Chamber has entertained on the subject of trading with the enemy. If your committee think it desirable, no objection will be offered to your publishing this letter

Rezende Mines.

The Rezende Mines, Ltd. (Rhodesia), made an estimated profit of £2,020 in the central section, and £1,038 in the old west workings and Penhalonga sections.

Geldenhuis Deep.

The report of the directors of the Geldenhuis Deep for the quarter ended the 30th of June shows the working profit—£36.310—to have increased by £9,599. The development footage increased by 1,797 feet, as compared with the previous quarter, and the tonnage crushed was 18,700 tons greater. The fall in the yield of 11d. per ton milled has been more than offset by an improvement in the working costs of 1s. 8d. per ton. The total working expenditure was at the rate of £1 2s. 7d. per ton milled, and the gold won was equal to £1 7s. 4d. per ton milled.

According to a contemporary, Germany now has fourteen large airships, including seven Zeppelin destroyers. Their size is on the average 600,000 cubic feet, and they carry 600 to 800 horse-power motors. A crew of fifteen to twenty men is carried, also eight tons net load, comprising 1·5 tons of projectiles. Between Berlin and the frontier are thirty balloon sheds and grounds with sheds of 600 feet length in many cases, pivoting upon large platforms so as to face the wind and allow the airships to enter safely. Balloon supplies are well looked after, and special railway cars are fitted out with sets of steel hydrogen bottles mounted upon a common discharge pipe. Such cars are kept stationed in works which furnish hydrogen as a by-product, and are ready to be sent out upon the railway wherever they are needed. The German army counts considerably upon night trips with the airship or aeroplane fleet, and all the needed measures have been taken to allow of doing this in good condition, the landing grounds being lighted at night and a system of coloured electric flashes, as in lighthouses, shows special signals for each of the grounds. A powerful electric searchlight on board the airship also lights up the ground when landing.

Globe and Phœnix.

August development: 14th level 128 ft., average 56 dwts.; raise advanced 38 ft., 14 dwts.; winze advanced 31 ft., 38 dwts. over 43 ins. 19th level advanced 55 ft. north, 58 dwts.; 50 ft. south, 163 dwts.; winze advanced 26 ft., 67 dwts. over 63 ins. 21st level advanced 101 ft.; average 10 dwts.

It appears from an article contributed to the *Vossische Zeitung* by Dr. Emil Lederer that German trade has already been "smashed to atoms." The fact that all the most active men have been enrolled in the many armies that Germany has put in the field has played havoc with the industries of the country and the financial expedients adopted have been fruitless. Works continue to be shut down daily, and even those men that remain are unable to find occupation. Luxuries of all kinds are no longer exported from Germany, and the raw materials, copper is especially mentioned, on which much of her trade depends can no longer enter the country. Finally, demand has fallen off because all the men in service no longer demand the things they used to demand in peaceful times. Thus, all the industries of the country are totally disorganised, and Dr. Lederer looks upon the future in the gloomiest light. He recommends the appointment of a permanent committee under the Ministry of the Interior, this committee to investigate the whole question and see if anything can be done to save the industries before it is too late.

INVESTORS' DIARY.

FORTHCOMING COMPANY MEETINGS.

Oct. 23. Rooiberg Minerals.
Nov. 10. Johannesburg Consolidated Investment Company.
Nov. 16. Nourse Mines, New Modderfontein.
Nov. 20. Glynn's Lydenburg.

New Registrations.

The following is a list of companies registered in September: -

Model Steam Laundry, Ltd., Johannesburg; capital £1,000.

Carson Mines, Ltd., Johannesburg; capital £4,250.

Manufacturers and Exporters Agency, Ltd., Johannesburg; capital £2,000.

Hassim Moti, Ltd., Pietersburg; capital £3,000.

Hughes Meat Market, Ltd., Johannesburg; capital £1,000.

The Kangaroo Tobacco Company, Ltd., Rustenburg; capital £800.

The Vryheid Coke Company, Ltd., Johannesburg; capital £20,000.

Northern Copper Syndicate, Ltd., Johannesburg; capital £100.

The Economic Sick Benefit Association, Ltd., Johannesburg; capital £5,000.

Rowland Chute & Company, Ltd., Johannesburg; capital £500.

Union Chrome Tanning Company, Ltd, Johannesburg; capital £7,500.

The Adler Garage, Ltd., Johannesburg; capital £8,000.

ALTERATIONS AND ADDITIONS TO FOREIGN COMPANIES.

4234. C. A. Macdonald, Ltd., Johannesburg.
3598. Sandycroft, Ltd., Johannesburg.
3696. Klipwal Pongola, Ltd., Johannesburg.

NOTICES OF INCREASE AND DECREASE OF CAPITAL.

152. National Diamond Prospecting and Developing Syndicate, Ltd., Johannesburg; reduced from £170,000 to £17,000.
152. National Diamond Prospecting and Developing Syndicate, Ltd., Johannesburg; increased from £17,000 to £50,000.
450. Salai & Dickinson, Ltd., Pretoria; increased from £1,500 to £2,000.

SPECIAL AND EXTRAORDINARY RESOLUTIONS.

5730. Artesian Mineral Waters, Ltd., Johannesburg; amendment of articles.
380. The Bourke Trust and Estate Co., Ltd., Pretoria; amendment of articles.
2162. Orangia Coronation East Exploration Syndicate, Ltd., Johannesburg; liquidation.
2908. Parktown Ice Company, Ltd., Johannesburg; liquidation.
4425. The South African Farmers' Guide and Industrial Gazette, Ltd., Johannesburg; liquidation.
3984. R. & J. Fleming, Ltd., Johannesburg; agreement.
87. "The Jumpers" Gold Mining Co., Ltd., Johannesburg; liquidation
4436. A. J. de Voogd & Co., Ltd., Johannesburg; change of name.
3452. National Diamond Prospecting and Developing Syndicate, Ltd Johannesburg; reduction of capital.
2519. The Merchants' Trust, Ltd., Johannesburg; amendment of articles.

COMPANIES IN LIQUIDATION.

2162. Orangia Coronation East Exploration Syndicate, Ltd., Johannesburg; voluntary.
2908. Parktown Ice Company, Ltd., Johannesburg; voluntary.
4425. The South African Farmers' Guide and Industrial Gazette, Ltd., Johannesburg; voluntary.
87. "The Jumpers" Gold Mining Co., Ltd., Johannesburg; voluntary.
3897. The Irish Ham Store, Ltd., Johannesburg; by order of Court.
4030. The Transvaal Tanning Company, Ltd., Pretoria; by order of Court.

NOTICES OF CHANGE OF ADDRESS.

4058. African Mining, Finance and General Agency, Ltd., 95-96 New Stock Exchange, Johannesburg.
4258. The Rand Pawnbrokers', Ltd., Stand 274, 116 Commissioner Street, Johannesburg.
2679. Horner & Company, Ltd., 268 Market Street, Pretoria.
2957. The Premier Coal, Ltd., B. & T. Buildings, 68 Commissioner Street, Johannesburg.
3402. H. W. Allkin & Co., Ltd., 19 Sacke's Buildings, Joubert Street, Johannesburg.
4000. Lamb, Raphaely & Co., Ltd., 45 Simmonds Street, Johannesburg.
1312. Transvaal Real Estates,' Ltd., 151-152 Stock Exchange, Fox Street, Johannesburg.
1507. H. & J. Israel, Ltd., 151-152 Stock Exchange, Fox Street, Johannesburg.
2303. Du Preez Consolidated, Ltd., 151-152 Stock Exchange, Fox Street Johannesburg.
2560. Diamond Mining Investment Company, Ltd., 151 152 Stock Exchange, Fox Street, Johannesburg.
3152. South Midas, Ltd., 151 152 Stock Exchange, Fox Street, Johannesburg.
4006. Rietfontein Van Ryn Extension Syndicate, Ltd., 151 152 Stock Exchange, Fox Street, Johannesburg.
3831. Ornamental Furniture Co., Ltd., 161a Commissioner Street, Johannesburg.
4197. General Enterprise Co., Ltd., 94 Stock Exchange, Johannesburg
4261. Asmana & Company, Ltd., 9 Carlton Hotel Buildings, Commissioner Street, Johannesburg.
4312. American Novelty Co., Ltd., 45 Simmonds Street, Johannesburg.
4059. Chancellor Diamond Syndicate, Ltd., 151-152 Stock Exchange, Fox Street, Johannesburg.
4103. Roodeplaat Diamond Mining Co., Ltd., 151 152 Stock Exchange, Fox Street, Johannesburg.
4335. Harrisdale Diamonds, Ltd., 151 152 Stock Exchange, Fox Street, Johannesburg.
4273. Peach Tree (Transvaal) Syndicate, Ltd., 51-52 Chudleigh Buildings, Eloff Street, Johannesburg
4120. Atbur, Ltd., 101 Market Street, Piet Retief, Transvaal.

AMUSEMENTS.

NEXT WEEK'S PROGRAMME.

His Majesty's—J C. Williamson's Co.	8.15
Standard Tiller Co.	8.15
Empire—Varieties	8.15
Palladium	8.15
Carlton	7 to 11.15
Orpheum	7 to 11.15
Bijou	7 and 9

TO CONTRIBUTORS.

The Editor invites Contributions on any subject of interest relating to mining and other industries of South and Central Africa, as also of suitable non-copyright photographs or snapshots of mining or engineering interest. Subject to special arrangement, the scale of remuneration for all articles inserted is at the rate of Two Guineas per page, and 5/- for every photograph. No responsibility can be accepted for safe transmission, but anything that may be submitted that is not accepted will be returned if a stamped and directed envelope is enclosed for the purpose.

WOLHUTER GOLD MINES, LIMITED

(Incorporated in the Transvaal).

DIVIDEND No. 14.

NOTICE is hereby given that a Dividend of Six and One-quarter (6¼) per cent for the six months ending 31st October, 1914, equal to 1s. 3d. per £1 share, has been declared payable to Shareholders registered on the 31st October, 1914.

Dividend Warrants will be paid out as soon as practicable after the receipt of London Transfer Returns to that date.

Holders of Share Warrants to Bearer are informed that they will receive payment of the Dividend on presentation of Coupon No. 14 at the London Office of the Company, Salisbury House, London Wall, E.C.

The Transfer Registers of the Company will be closed from the 2nd to the 5th November, 1914, both days inclusive

By order of the Board,
A. GREGOR, Acting Secretary.

Head Office, Johannesburg,
14th October, 1914.

36928

Johannesburg Consolidated Investment Company, Limited.

(INCORPORATED IN THE TRANSVAAL.)

NOTICE OF GENERAL MEETING OF SHAREHOLDERS.

NOTICE IS HEREBY GIVEN that the Ordinary General Meeting of Shareholders in the above named Company will be held in the Board Room of the Johannesburg Consolidated Investment Company, Limited, on TUESDAY, THE 10TH NOVEMBER, 1914, at 11.30 o'clock in the forenoon, for the purposes following:—

To receive and consider the Statement of Accounts and Balance Sheet for the period ending the 30th June, 1914, and the Report of the Directors and Auditors thereon.

To elect four Directors in place of those retiring, in terms of the Company's Articles of Association.

To elect Auditors, and to fix their remuneration for the past financial year, and to transact any other ordinary business of the Company.

By Order of the Board,
W. H. MARDALL,
Secretary.

Johannesburg,
23rd September, 1914.

35387

THE SOUTH AFRICAN
Mining Journal,
WITH WHICH IS INCORPORATED
South African Mines, Commerce and Industries.
ESTABLISHED 1891.

VOL. XXIV., PART I.] OCTOBER 24, 1914. [No. 1204.

HEAD OFFICE: 176-180, Stock Exchange Buildings, Fox Street (2nd Floor), Johannesburg, Union of South Africa.

Telephone **913.** P.O. Boxes **963** and **418.**

Cable and Telegraphic Address: "**MINING JOURNAL.**"

AGENTS FOR GREAT BRITAIN: Argus Printing and Publishing Co., Ltd., Byron House, 82-85, Fleet Street, London, E.C.

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NOTICE.—The postage of this issue of the *S.A. Mining Journal* is: South Africa, ½d. All other parts, 1d.

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Notes and News.

Claimholders and Licences.

It is noteworthy that under the Gold Law men going on commando who own claims can have their claims secured to them without payment of claim licences in the interim whilst they are serving. However, to secure this concession, they must before leaving give notice to the Mining Commissioner of the district where they hold claims, stating what claims they hold, and that they are leaving for the front. On their return they must notify the Mining Commissioner, when they will be given thirty days in which to take up the claims again.

* * * *

The Diamond Market.

The imports of precious stones, consisting chiefly of diamonds, into the U.S.A. for the week ended September 19, are, according to the Government's returns, valued at $24,000. This, says the *Financial News*, compares with $141,000 in the previous week, with $334,000 in the corresponding week last year, and $653,000 two years ago. Sir Thomas Cullinan, in defending the action of the Premier Diamond Mining Company in shutting down on the outbreak of hostilities, stated recently that in the four months prior to the war the company had not sold diamonds sufficient to meet expenses, and that the accumulated stock of stones on hand represents a value of £750,000. At the end of October last the diamonds on hand were valued at £461,802, so that within nine months there has been an increase of £288,198.

* * * *

Victoria Falls and Transvaal Power.

The position of the Victoria Falls Company is of interest at this juncture. The capital authorised and issued is £3,000,000, in 1,000,000 ordinary shares of £1 each, 2,000,000 six per cent. cumulative and participating preference shares of £1 each. Debentures outstanding are £3,000,000 five per cent. first mortgage, £1,626,500 five and a-half per cent. second mortgage. The profit for the year ended 31st December, 1913, was £467,823. The six per cent. preference shares, participating up to 10 per cent., are quoted at about 13s. 6d., at which price the yield is £8 17s. 6d. per cent., without taking into consideration 9 per cent. dividend in arrears at this date. The company supplies electric motor power, etc., to the principal mines of the Rand, and its profits now show large expansion. A stoppage of the gold production will be avoided and every facility without doubt be given for further developments, so that the company's sphere of operations should expand. The ordinary £1 shares stand at about 5s.

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The Position in Great Britain.

The latest advices to hand in regard to the financial and industrial position in Great Britain are most reassuring. A well-informed correspondent writes:—"The effects of the first shock of war are passing. The acuteness of the financial and commercial crisis has diminished and is still diminishing, but naturally the steadying process will be a work of time, and for the present trade is more or less restricted. It does not require an optimist to predict a period of exceptional activity to follow immediately upon the termination of the war, but if the fullest advantage is to be taken of this, works must be maintained in going order and the workmen kept together over the quiet period, and there is little reason to doubt that this can be done if manufacturers will meet each other in a fair and generous spirit. Opinions differ, however, concerning the further extension of the moratorium. A London meeting of commercial men has recommended that course; but opposite views are also very strongly entertained. No doubt the Government has obtained the best advice on the subject, having at its command the willing assistance of experts of all parties, and the decision is to close it on November 4. In fact, there seems to be every prospect of the financial difficulties arising from the war being triumphantly overcome in due course, and then our foreign as well as our home trade will resume something like its normal aspect. Despite the raids of the Emden, our mercantile marine has not suffered materially, and the risk of danger from floating mines appears to be diminishing in view of the untiring vigilance of the Navy, the result being that underwriters have been accepting war risks freely at reduced rates. Freight rates have also fallen from the high level which they attained during the early days of the war, and, in fact, there is a strong tendency towards the resumption of normal conditions generally."

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Position in the Congo.

According to Dr. Lane, who held the position of District Surgeon on the construction work in the Belgian Congo, that part of the country, says the *Bulawayo Chronicle*, has not been affected to any very marked extent by the war. The copper mines, contrary to report, have not closed down, though the employees are only drawing half pay, the remainder being put in the bank at 5 per cent. interest, at the instigation of the authorities, who have deemed it advisable to make provision for possible distress in the future. The employees for the most part are not unappreciative, and have accepted this procedure with the same spirit in which it was proposed. The railway construction work, however, which had reached as far as kilometre 220, has ceased, the natives as well as the staff all having been paid off. The diamond mines, when Dr. Lane left, were still working, and there was no suggestion of their stopping. Volunteer work is on a decidedly active footing—in Elisabethville, at any rate, the Belgian community having contrived to raise three companies, in all about 400 strong. This force includes many Englishmen and Greeks.

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Germany: Old and New.

Perhaps the most striking and comprehensive review of the situation which culminated in the war, and the circumstances which have inspired German policy, is contained in the special war number of the "Round Table" (September issue) received during the past few days. The aims of modern Germany, the ideals of Prussian autocracy, and the new "religion (?) of war," as exemplified by the doings of the Kaiser's armies in Europe, are here sketched with a master hand. The contrast between the older Germany, whose ideals were literary, artistic, philosophic, the Germany of Beethoven, Goethe, and Kant, and the military madness which has been developed by the ruling powers of the united nation created by Frederick the Great, Scharnhorst, Bismarck, and Moltke, is realistically brought out.

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The Question of Patents.

Mr. Temple Franks (Comptroller-General of Patents) has now held several sittings with Sir Cornelius Dalton (his predecessor) at the Patents Office, in London, to consider applications to avoid or suspend German patents under the legislation passed since the outbreak of the war. In the course of the hearings the Comptroller explained the position of an applicant in regard to the payment of royalty. In one case he questioned the applicant as to whether he would be prepared to pay royalty, the money to be held by the State until the war was over. He explained later that it would not be fair to deprive the German patentee of his property. Generally speaking, the recommendation the Court would make would probably be that some kind of licence would be given, and that licence, if it continued after the war, would be subject to the royalty to the patentee, such as might be arranged either with the patentee or by arbitration. If the licence only continued during the war he was not sure that it would not be equitable even then that there should be some royalty payable either to the State or to the patentee, as the case may be. An article on the subject appears elsewhere in this issue.

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Recruiting and Mine Employees.

In a letter printed in this issue a correspondent draws attention to the fact that Mr. F. H. P. Cresswell, M.L.A., in the course of a recruiting speech, is alleged to have questioned the necessity of limiting the number of mine workers going on active service at this juncture. We have no record of Mr. Cresswell's actual words, and therefore hesitate to condemn him, more particularly in view of his efforts on behalf of the Rand Rifles Regiment, now being formed under the command of Major Tremeer, D.S.O. It may be well, however, to repeat the advice tendered by the Government, which puts the whole matter in a very clear and commonsense light. The letter, addressed last week to the Secretary to the Chamber of Mines by the Secretary for Defence, is as follows:—

Department of Defence,
Pretoria, 11th October, 1914.

Sir,—I am directed by the Minister of Defence to state that the Government is exceedingly anxious to secure the hearty co-operation of all mining companies and employers of mining labour on the Witwatersrand and elsewhere in assisting the war recruiting scheme to the utmost extent, but the Government is equally anxious that there should be no dislocation of the mining industry or any diminution of the gold output owing to mines being depleted below the minimum staff of European employees which is essential to maintain the industry in full working order. The Government is profoundly gratified at the keen and enthusiastic response to the call to arms which has been given on the Witwatersrand and elsewhere, but it hopes that citizens whose services are essential to the proper working of the mining industry will recognise that their duty to the Union and to the Empire lies not at the front, but in keeping this great Imperial and South African asset—the gold industry—working to its fullest capacity. The Minister understands that the mining companies are prepared to give generous terms to their employees who volunteer for active service, and can be spared, the terms being half pay to all such men as have dependents, and a promise of re-employment on return from the front. The Government, however, does not for a moment suggest that these terms should be offered to employees whose services really cannot be spared without serious detriment to the working efficiency of any particular mine. The recruiting committees and recruiting officers on the Witwatersrand are being notified of the Government's attitude in this matter, and the Minister is confident that the Government can count on the good sense and patriotic spirit of the people of the Witwatersrand to support them.—I am, etc.,

H. R. M. BOURNE,
Secretary for Defence.

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Heavy Depreciation in Securities.

Recently we quoted from the *Bankers' Magazine* some illuminating figures showing the heavy depreciation which had taken place in the value of securities during recent years. Our contemporary stated that, compared with January, 1907, when it first presented its list of 387 representative securities, there had been a total depreciation of £660,000,000 up to July 30 of this year. In the current issue of the *Bankers' Magazine* there appears a table showing in detail the movements which have occurred in the various departments during the seven and a half years, with the following result: Aggregate value of 387 representative securities on January 21, 1907, £3,843,177,000; aggregate value of 387 representative securities on July 30, 1914, £3,182,717,000; decrease, £660,460,000. With the exception of insurance shares, shipping shares and a few tramway and omnibus stocks, every department of the Stock Exchange shows substantial losses for the period under review. In the case of British and Indian funds the decline is as much as £158,000,000, while Foreign Government stocks and American Railway issues have fallen about £112,000,000 and £120,000,000 respectively. A very heavy percentage decline is that which has occurred in British Railway ordinary stocks, which show a loss of about £53,000,000, or 17 per cent. In the purely speculative markets the outstanding feature has been the decline in mining shares, South African gold and land shares, and the shares of copper mining companies showing a decline of about 48 per cent. and 38 per cent. respectively.

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Trade Debts and the War.

The problem of foreign indebtedness to traders in the United Kingdom has since the outbreak of hostilities engaged the serious attention of all sections of commercial men, whilst the Association of Chambers of Commerce has been in communication with the Treasury and the Board of Trade on the subject. The suggestion has been made that a clearing-house should be established for the purpose of adjusting assets and liabilities as between Great Britain and the belligerent countries, and this idea was endorsed in influential circles. Now, however, it is announced that the Government are not disposed to favour such a scheme because of "insuperable difficulties." At the same time, it is stated that the Chancellor of the Exchequer is desirous of assisting traders who have considerable debts due to them, not only by traders on the Continent of Europe, but also in the United

States of America, Canada, and South America, where difficulties are created by reason of the high rate of exchange. It is necessary in the first instance, however, to have some idea of the amount involved, and, with the object of placing such information in the hands of the Chancellor of the Exchequer, the various Chambers of Commerce are asking their members to supply the necessary details.

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A New Form of Labour Trouble.

A labour war has broken out at Butte, Montana, which resembles the great war in Europe, in that each was so long expected that fears had been allayed in the idea that neither would ever really happen. As for Butte, the explosion could hardly have happened at a more opportune time or with more auspicious circumstances. If the miners do not want work it makes no great difference to the employing company, which will be entirely satisfied if it can during the present period of distress keep its thousands of men from starving even if it makes no money itself. From the American papers we learn that the present trouble at Butte is not like the ordinary labour dispute between the employer and the employee. There are none of the elements of self-interest that there were in the Lake Superior strike. At Butte it is primarily a fight between two labour unions, one of which does not want to let the other one work. Incidentally one has dynamited property of the other, and there has been some murdering, not of " scabs " but of members of a labour union in good standing. In the meanwhile, the company has stood aloof except for some concern lest the combatants should destroy some of its property, the remarks of one labour leader to the effect that he was going to run the mines and things in Butte generally being of a threatening nature. However, since martial law was declared and troops appeared on the scene, insuring the safety of the property of the mining companies and other citizens, there has been a feeling of relief and a willingness to see tested the principle of the right to work and whether that right belongs alone to members, not merely of a union but of one particular union. Thus is there a prospect of a great labour question being fought out without any participation by the employer and without any interest in making political capital on the part of the cheap politicians.

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The Iron and Steel Market.

Although new business has been on the quiet side and specifications have not been coming in so well, writes a North of England correspondent, the position in the manufactured iron and steel trades is, under all the circumstances, very satisfactory and producers are by no means pessimistic. Orders have been booked sufficient to carry on the works until Christmas, and so far from pressing sales, makers are rather disposed to mark time, while some are declining to commit themselves any further ahead at current rates. The improvement in export material has not yet been realised, but this is not to be wondered at when the increased price of freighting, heavy war risk insurance and financial difficulties are taken into consideration. These have all tended to make buyers abroad hesitate before ordering material or fixing up fresh business. There is no doubt, however, that many orders will eventually come home to local manufacturers, but some time must elapse before altered conditions adjust themselves in the export trade and any great volume of business results. Manufacturers are looking forward to busier times as soon as hostilities on the Continent cease, and with the reputation that British material has made for itself abroad and with Colonial preference in addition, the northern iron and steel trade ought to be in a brighter condition than it has ever been. The iron bar trade already seems to have taken a new lease of life, the general condition being better and prices more profitable than for a long time. In the past bar producers have suffered severely from foreign competition, and now that it has been completely cut off makers have received extensive orders from home consumers. The prospects in this department of the finished iron trade are certainly very encouraging, and other branches are likely to benefit in the near future. There is little new to report concerning the galvanised sheet trade, although spelter appears to be easier in price and less stringent in supply. Quotations for all descriptions of iron and steel are firmly maintained.

TOPICS OF THE WEEK.

BRITISH MINING SUPPLIES, THE U.S.A., AND THE WAR.

Some extraordinary views have gained currency amongst our American cousins with regard to the European war, especially in respect to the position of the British nation. Industrially speaking, the technical press in the States seems to regard Great Britain as *hors concours*, and philanthropically calls upon American manufacturers to come to the aid of the neutral nations which can no longer obtain goods and apparatus from the European sources upon which they have hitherto relied. For instance, in the New York *Electrical World* Dr. Louis Bell states that the United States is " the only nation upon which war has not laid the hand that strangles." He remarks that the war " removes from the ranks of labour every workman of active years who is not absolutely needed to provide material of war in every country having compulsory military service." But it is not true even in such countries. The *Vorwärts*, apparently the only German paper that publishes unpleasant facts, estimates that at least a third of the working men in all the large towns in Germany are unemployed, and the number is increasing. Germany's export trade has been arrested by the British Navy—but British manufacturers are at liberty to supply goods to the whole of the world that is not at war. " So far as active commercial work goes," says Dr. Bell, " one may as well reckon every door as closed in all the warring Continental countries "; but, happily, Great Britain is not Continental, and he recognises that " such residuum of the British works as may be able to keep up activity . . . will hold up with fair success " since England controls the seas and possesses freedom of transportation. Dr. Bell urges that the United States should not provide loans for the promotion of bloodshed, but save up its capital " for the promotion of the world's (*sic*) industry when peace comes at last." The *Engineering Magazine* for September similarly harps upon " America's opportunity in an Old-World Catastrophe," and publishes a " war map of the world," showing how small a proportion is left open to peaceful commerce. To arrive at this result, not only the European countries, but the *whole of the British Empire* and all Africa are shaded to show that they are affected by the war—as if the trade and industry of South Africa, Canada, Australia, India and the rest were suspended! The writer of a special article, Mr. H. Emerson, says, without any hypocrisy about rescuing the neutral world from ruin for want of European goods, " the national opportunity of a millenium is ours!" But he also deplores the unpreparedness of his nation, and points to South America as the golden opportunity. In an editorial note the same view is taken, that England is paralysed as well as the Continental States, and "the United States must become both granary and workshop for all the world." To all these lucubrations our London contemporary, the *Electrical Review*, replies in the following brave words: " It is our duty to point out to the United States, and incidentally —more important in effect—to all the consuming countries of the world outside Europe, that we are *not* out of the running. We are giving of the best of our young manhood to the war, it is true, but our manufactories are not idle, our export trade is not strangled, our hands are not tied. We are ready and willing to fill orders for all kinds of electrical machinery and apparatus, cables, lamps, batteries—we want good prices for our wares, but we will supply good value. Our motors are not like the German motors, rated at 5 h.p. and fit to work at 3; our cables are of quality unexcelled. We are at war not only with the sword, but also with the order-book, and we look to all friendly and neutral nations to buy from us the things that they used to purchase from our present enemies. We can make them and we can transport them, and all this talk about our being paralysed is utterly mistaken. We do not say it is deliberately false, but it is untrue all the same."

RE-OPENING THE STOCK EXCHANGES.

As the prospect of reopening the Johannesburg Stock Exchange is bound up with that of the London Stock Exchange, the position of the latter is of very considerable interest on this side. For some little time there have been strenuous efforts made to arrive at a scheme which would permit of the reopening of the London Stock Exchange. It is now pretty well understood that the position at the closing of the "House" was that the Stock Exchange owed to the banks and other financial institutions about £63,000,000 in loans with margin and about £17,000,000 in loans without margin. In regard to these loans, it should be understood that loans with margin represent the ordinary loans from the banks, in which case the deposit of securities in excess of the amount borrowed is demanded, affording the margin for the loans. In the other case, the loans are really in connection with contangoes, where securities are taken over at the making up prices, and the loan is granted at a higher rate, because no margin is demanded. The great difficult in reopening the Stock Exchange lies in regard to this £80,000,000 of loans. Any reduction in prices below the level of July 30 will involve a reduction in margin and endangers the position of those who borrowed. All attention, therefore, has been directed to drawing up some scheme whereby this loss should be provided for. The Stock Exchange itself decided, after mature consideration, upon a certain scheme, but we believe that this was not well received by the banks, and modifications are now being discussed. The parties, however, are getting closer together, and it seems to us that in a short time a scheme will be worked out which will provide for the Stock Exchange position, and so render possible the reopening of the "House." This is from the financial point of view, but, of course, there is the political side, and from this point there is still uncertainty. It is all very well for a great effort to be made on behalf of the Government, banks and Stock Exchange, but if this effort is only followed by bad news from the war, it would be of little benefit to have the "House" open. Until there is more definite good news, therefore, the present position is likely to be maintained both here and in London. It is noteworthy that as far back as 27th August it was asserted in responsible quarters that an organised attempt was made by the Germans to attack the London Stock Exchange, and the German Treasury was credited with having sold or attempted to sell £4,000,000 of Canadian Pacifics. It is significant that during the ten days prior to the declaration of war by Germany against Russia, Canadas slumped nearly 30 points, and it is maintained that the heavy all-round selling from Berlin was part of a campaign to endeavour to cause a panic and help to influence Great Britain against taking prompt action in supporting its Allies. Indeed, the semi-official *North German Gazette* openly boasted of the emergency measures adopted by the Bank of England. Such were largely due to the huge amount of German paper which the Deutsche Bank, the Dresdner Bank and the Disconto-Gesellschaft had left unprovided for in Lombard Street. A few months ago it would have been difficult to accept the statements that German interests did plan an organised financial campaign against London, but certain it is that such a deadly weapon could have been used, and in the light of subsequent developments undoubtedly was used. It is stated that last November the Kaiser asked the directors of the Imperial Bank of Germany if they were then prepared for war. Upon being told no, he said that he should expect a different answer when he again asked the question. In view of the foregoing, it is easy to credit the report that certain naturalised German firms who are members of the House have not complied with the order of the Committee to send a statement of their commitments. It is expected that the Committee, backed up by the Government, will be in a position to deal effectively with such people. Meanwhile it is as well to call attention to the recent Proclamation contained in the *London Gazette*. In the course of the announcement in question forbidding business with the enemy it was stated that it was illegal to "enter into any new transaction or complete any transaction already entered into with an enemy in any stocks, shares or other securities." This is in effect an order to brokers carefully to inquire the source of the selling orders they have executed, as is being rigidly done by the banks. By so doing, it is pointed out, they will not only render the country signal service, but will do much towards lessening the losses to be faced by the Stock Exchange arising largely out of the hostile methods adopted by German financial interests. Everyone knows how well Germany had engineered the war from a military point of view. London now knows equally well that similar preparations had been made by the "Fatherland" in regard to the all-important question of finance.

THE GERMAN CREDIT SYSTEM.

It is notorious in South Africa that one of the chief difficulties with which British and American manufacturers have been confronted in the past has been the long-credit system employed by the German organizations. An illuminating article on the position considered from the point of view of the manufacturer appears in the current issue of the *Engineer*. The writer refers to occasions on which German firms have in some engineering lines been allowing two, three, four and five years' credit, and he gives particulars of what we should imagine is the limit—a case in which *ten* years was allowed! German tenderers meant, at all costs, to secure an order for two gas engines for a municipality in Italy. When they offered to accept instalments spread over ten years the British firms withdrew, and the order went to Germany. According to British standards and beliefs, business on those conditions was best left alone. By the war in Europe, German manufacturers are for the time being, at all events, eliminated from the world markets. The writer of the *Engineer* article, after expressing the conviction that the death struggle will leave Germany absolutely exhausted financially and unable to hamper us with her trade competition for years to come, says that whereas in the past British exporters must have sustained heavy losses through being compelled to follow their rivals' methods, and give unwholesome terms of credit, the position has now been greatly altered by the sudden withdrawal of their only important rival, and that rival responsible for the long-credit system. It is hoped, therefore, that in their efforts to take advantage of the unprecedented chance of expansion of exports, they will realise that "the main reason of the credit cancer that has done so much harm, is gone," and that "a pernicious system that was forced on us by our enemy, should be abolished for good now that the opportunity offers itself." British firms in pursuit of foreign business are urged not to try to outbid one another by again granting extended credit, and the larger firms in the engineering industry, whose financial ability would enable them better than smaller concerns to grant favourable terms, would be doing a great deal to relieve the situation and lead to the removal of the system for many years if they would fall in with the suggestion, and compete with other Home firms on industrial rather than on financial merit. It may be thought that this attitude ignores the activities of the American exporter, but, so far as we can recollect, the long-credit system has seldom been indulged in by American firms. Indeed, we believe that they have been criticised by their own advisers repeatedly for their unwillingness to give what we regard as ordinary export credit. Ready money appeals to the American business man, and America need not be regarded as a factor to be seriously reckoned with in any efforts that Britishers may contemplate making to stamp out the system which allows the purchaser to pay for his purchases perhaps years after he has worn them out and put them on the scrap-heap.

THE POSITION OF THE KNIGHTS DEEP.

Points from Annual Reports—Improved Prospects—Native Labour Outlook Brighter.

THE sixteenth ordinary meeting of shareholders in the Knights Deep will be held on Friday, 30th October. The working expenditure and revenue account shows that the profits on working for the year, after allowing for the expenditure of £13,035 11s. 11d. on renewals and replacements of machinery, plant and buildings, amounted to £142,951; add sundry revenue, £4,300; total, £147,255; less contributions to Miners' Phthisis Compensation Fund (£9,280), strike expenditure (£666), amounts written off (£204), debenture interest, etc. (£4,318), and profits tax (£1,138), £15,609; leaving a nett profit for the year of £131,645; add balance at credit of appropriation account at 31st July, 1913, £77,362; total, £209,008; from which has been appropriated—for redemption of debentures and capital expenditure, £33,352; for dividends Nos. 17 and 18 declared during the year, £74,352; for fund for additions to and renewals of machinery, plant and buildings, £13,730; less expenditure on renewals during the year, charged to working expenditure and revenue account, £13,035; leaving a balance at credit of appropriation account at 31st July, 1914, of £100,608.

In the course of his annual report, the Superintending Engineer, Mr. C. D. Leslie, writes:—I beg to hand you report by your Manager covering the operations on your property during the year ended 31st July, 1914. As compared with the previous year the tonnage milled was decreased by 3,821 tons, and the revenue by 5.537d. per ton milled, while working costs were increased by 1.425d., the net result being a decreased working profit of 6.962d. per ton milled, or a total of £32,872 3s. 2d. Residues were decreased by 0.090 dwt. to an average of 0.255 dwt. equal to 11.318d. per ton milled, and the percentage recovery increased by 2.032 per cent. In addition to industrial disturbances and acute shortage of native labour during the greater part of the year, this mine has suffered from stoppages due to accidents to plant and shaft equipment, and also from lower grade on account of a falling off in the value of reclamation ore. The native labour supply has improved considerably, and if this improvement is maintained and normal conditions of working prevail during the ensuing year the mine should attain a monthly rate of profit appreciably higher than the average for the year under review. The Connor Vertical Shaft was sunk for a further distance of 127 ft. during the year, to a total depth of 1,417 ft. The development footage accomplished during the year amounted to 2,226 ft., of which 1,090 ft. were sampled, indicating a reef width of 37.7 in., and a reef value of 10.13 dwts. The fully developed ore reserve at 31st July, 1914, is estimated at 2,480,000 mine tons, valued at 4.2 dwts., and the partially developed ore is estimated at some 200,000 tons, to which has been assigned, from existing information, a value of 3.9 dwts., until further disclosures permit of a more reliable valuation. The reserve tonnage is more favourable than would appear from the above figures, because of undeveloped areas not taken into account which will be attacked from existing stope faces. Reclamation tonnage, which is likely to contribute a considerable proportion of the ore to be drawn from this mine in the future, has not been included in the reserve estimate because it cannot be valued from disclosures in reclamation faces supplying the main information with regard to it. As compared with previous experience, it is being found now that a larger percentage of the reclamation ore being met with has to be regarded as unprofitable and left in position, and on the exception that there is likely to be a decline in the percentage of reclamation rock to be dealt with in the future, concurrently with ore from stope faces, the rate of development is being extended so as to add to the security of the mine by relying on drawing an increased proportion of ore from stope faces. Estimates have been authorised for plant to fill the underground workings with current sand to be delivered through two boreholes to be sunk from the surface.

In his annual report, the Manager, Mr. G. A. Chalkley, writes, *inter alia*: During the year the following additions and/or renewals were made to the plant: An electric winder has been installed at the Connor Shaft. The Sand Plant has been increased by the installation of Automatic Underflow Regulators for Sand Classifying Cones. A beer kitchen has been installed in the eastern section compound. The work in connection with the installation of the Underground Lohse Pumping Sheeme has been completed. The sand tank columns foundations have been renewed. Considerable alterations have been effected at the Connor Shaft to facilitate hauling operations by sinking the vertical 127 ft., thereby changing from a one stage to a two stage hoist. The old rails and timbers of all four shafts are being renewed as soon as they show any appreciable wear; at present this is a considerable cost. During the year we have greatly increased the waste packs and other supports for Underground Lohse Pumping Scheme has been completed. The greater pressure being put on the Knights Deep ground by the working out of outcrop mines above us. Therefore, preparations are being made to start sand filling at an early date. The stoppage of recruiting of natives north of latitude 22 deg. has been of great detriment to this mine, as we were a large employer of this class of labour. Our old East Coast and Tropical boys are now being replaced by higher paid, shorter term, and less efficient natives.

EXHIBITION MINE AT THE PANAMA-PACIFIC EXPOSITION.

THE plans for the mine beneath the floor of the Palace of Mines and Metallurgy at the Panama-Pacific Exposition, San Francisco, have now progressed under the direction of the Bureau of Mines to the point where it is expected that that the most comprehensive exhibit of mines and mining subjects, including mining equipment and supplies, which has ever been prepared for the education of the general public will be presented. Characteristic working places, or stopes, will be prepared in the mine to stimulate the character of the ore, or coal; and the methods of working—typical of some of the largest and most important copper, silver, lead, gold, and anthracite and bituminous coal mines of the country and motion pictures will be shown in one of the rooms of the mine, illustrative of workings such as open-cut copper and iron mines and stone quarries, which cannot otherwise be shown in such an exhibit. The plan of the mine itself gives a good idea of the manner in which the exhibit is to be presented. The entrance to the mine may be made by a shaft or by a slope which is located adjacent to the Bureau of Mines space in the Government exhibit. From the bottom of the shaft, which is on a lower level, the entry way leads past small rooms which will be used for exhibits of lamps, mining journals, etc., through metal mining stopes, showing two levels in which various mining machines will be shown as working exhibits. Beyond the metal mining rooms the entry leads past a room typical of the Pennsylvania anthracite mines and a room typical of the Pacific coast coal mines, in which the sloping veins occur. At this point steps in the entry lead to an upper level, along which are arranged rooms of bituminous coal mines. Opposite these, there occurs the motion picture room, in which will be shown the operations of some of the great open workings of the country, by means of which iron, copper and gold, and stone are obtained. The exit from the motion picture room leads direct to the slope exit from the mine which opens into the radium booth of the Bureau of Mines exhibit. Here actual radium emanations will be shown while the visitors' eyes are still accustomed to the darkness. The mine will be equipped with the usual tracks, trolleys, locomotives, cars, cages, hoists, motors, pumps, air compressors, drills, mining machines, signs, mine doors, etc., all of which will be installed as working exhibits. Each day there will be a demonstration of record and first-aid following an imaginary explosion in the mine. Rescue crews from the Bureau of Mines exhibit will enter the mine wearing apparatus and bring out the supposed victims, who will be given first-aid treatment in the surface emergency hospital, which will be one of the features of the Bureau's exhibit. Enough operating companies and manufacturers of equipment and supplies are already co-operating with exhibits and financial aid to assure the unqualified success of the exhibit; but the layout of the mine has been so arranged that other possible exhibitions can be accommodated, and already requests have been received for space which may involve additions to accommodate them.

ROCK TEMPERATURES IN THE MINES OF THE RAND.

Discussion of an Interesting and Important Subject—Uniform Methods of Comparison Necessary.

[By J. Gibson.

Mr. Moynihan's paper again draws attention to the question of rock temperatures, one which, without doubt, is interesting and important as well from the scientific point of view as from the more practical one of its relation to the actual conditions we find or are able to bring about in the mines. In this relation we are all deeply interested, but are we not prone to deal with the rock temperatures and those of the mines together instead of separately? It is the relative effect of the one on the other that is important to us. In regard to the methods hitherto used for ascertaining the rock temperatures, it has been customary to assume that comparatively shallow holes give results sufficient for the purpose, and before we commit ourselves to comparisons with other records it would seem that, at least, we should ensure the methods used are uniform. The author does not appear satisfied that the methods used are sufficiently accurate. Basing his argument on variations found in shallow holes on the earth's surface, he concludes that the results obtained by holes in the [illegible]. The question which seems pertinent is: "Are the methods sufficiently reliable to give us indications of temperatures which will be near enough to enable us to anticipate the conditions to be expected at and beyond a particular depth?" Viewing it in this way, it is possible that these results are not so misleading as the author believes. Perhaps they do not reflect the actual true temperatures of the rock masses *in situ*, but even so, it is not material to us. It would be very useful, however, if in making his reply Mr. Moynihan would suggest an alternative method whereby more reliable results might be obtained, also, if possible, some information were supplied as to the conductivity of rocks. He states that the cooling effect of air currents in workings probably extends for 100 ft. or more from the surfaces exposed. Whether this be so is not easy to prove, but it is certainly reasonable to suppose that a steady diminution from within the rock masses to the surfaces exposed by mining operations does take place. If this be so, then there is a certain rate of transference of heat from the rock to the air currents. This rate must be some function of the conductivity of the rock. It will also depend upon the capacity of the medium (*i.e.*, the air in contact with the rock) to absorb the heat radiated. So long, therefore, as there is somewhat more air in circulation than is sufficient to effect the removal of this heat radiated from the rock walls, unduly high working temperatures will not be experienced. We may therefore be fairly safe in concluding that it is not so much the actual temperature of the rock *in situ* with which we are concerned, as the temperatures, near enough to the workings to affect the air currents. So far, the majority of observations made have been undertaken with this end in view, rather than to determine the true rock temperature. In discussing what has been termed the "temperature gradient," as deduced from observations recorded by others, the author has selected individual records to try and prove the futility of any attempt to establish a gradient. Naturally enough, in doing so he finds between the records from certain points a negative gradient, but surely this is no argument that a gradient cannot be found, whether its equation be that of a straight line or not. Might I suggest, rather, that such records be considered, not individually, but in groups, with proper weights applied before the reliability is queried? Contrary to the assumptions made by the author in his text, seasonal variations at the surface do not appear to affect the mine air temperatures very much, possibly not more than a few degrees. From the point of view of efficiency of labour, however, one very important aspect of this question is the percentage of humidity when temperatures up to 85 deg. F. are experienced, and judging from the data available it is probable the estimate of Mr. Moynihan is nearly correct, that at about 5,000 ft. this limit will be reached on the Rand. Even before these high temperatures are attained, close attention to ventilation will be very necessary. It is also clear that consideration of the volume of air in circulation is most important, and that its velocity should not be low. In Prof. Cadman's paper this question is clearly discussed, and his conclusions will well repay studying. While under the necessity of using so much water in the form of sprays, etc., for dust allaying purposes, it would appear impossible to endeavour to improve conditions where high temperatures are found, by lowering the per centage of humidity and supplying a much drier air current. This phase of the ventilation question will, before long, have to be considered and dealt with in the deeper mines, and so far refrigeration appears to be the only practical alternative suggested.

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*Abstract of paper read before the Chemical, Metallurgical and Mining Society.

Competition with Germany and Austria-Hungary.

In connection with the campaign undertaken by the Board of Trade, on the advice of their Advisory Committee on commercial intelligence, to assist British manufacturers and merchants to secure trade formerly in the hands of German or Austro-Hungarian firms, the Board have received a very large number of inquiries for names of sellers or buyers of articles of which the sources of supply or market have been interfered with by the war. Special arrangements have been made in the Commercial Intelligence Branch of the Board of Trade for dealing with the inquiries, and lists are being prepared and circulated of articles which inquirers desire (a) to purchase, and (b) to sell. The first list was published on August 29: the second list is now ready and may be obtained on application to the branch. Firms interested in any of the goods mentioned, either as buyers or sellers, should communicate with the Director of the Commercial Branch, Board of Trade, 73, Basinghall Street, London, E.C.

The *Government Gazette* of the 16th inst. contains details of the new regulations framed under the Miners' Phthisis Act, 1912, and the Amending Act of 1914.

An Imperial Bucket Shop.

It is reported that the German Government is endeavouring to stimulate subscriptions to its new war loan—which, by the way, seems to have hung fire notwithstanding the generous subscription of Krupps—by guaranteeing the issue on the indemnity to be paid to Germany after the war. Potsdam appears to be adding to its methods of barbarism those of the bucket shop.

MINING INSTITUTE.
TEACHING CENTRES:— { JOHANNESBURG AND SCHOOL OF MINES, KIMBERLEY.

Prof. YATES prepares candidates for the following Government Certificates:—
MINE MANAGER'S. MECHANICAL ENGINEER'S.
MINE OVERSEER'S ELECTRICAL ENGINEER'S.
MINE SURVEYOR'S
by Class Private Tuition, and Correspondence.

SOME 1914 RESULTS:—
MANAGERS - - - January and May - - ALL Passed.
ELEC. ENGINEERS - February - - - - - 66% „
MECH. ENGINEERS - June (Kimberley Centre) - - ALL „
MINE OVERSEERS - - - - - Practically ALL „
NEARLY 200 SUCCESSES. **St. James' Mansions, Eloff Street.**

UNDERGROUND MANAGER AND STAFF OF THE ROBINSON GOLD MINING CO., LTD.

Bottom Row (left to right). W. S. Harris, shift boss; H. A. Adams, chief surveyor; F. H. Harris, mine captain; Edw. A. Nix, underground manager; E. Fisher, mine captain; W. Page, chief sampler; D. Brinkley, shift boss.
Second Row. J. Jordan, shift boss; M. J. Scott, shift boss; J. P. Ellis, shift boss; C. Hugo, shift boss; S. Miles, shift boss; W. Langley, foreman pipefitter; D. Maloney, surveyor.
Third Row. E. Silver, shift boss; H. Lindsey, sampler; C. J. Conez, sampler; L. Kretschmer, shift boss; B. Wakeford, shift boss; E. Jackson, shift foreman.
Back Row.—F. Baker, sampler; C. J. Reynecke, shift boss.

"S.A. *Mining Journal*" *Special Photographer.*

THE S.W. TRANSVAAL DIAMOND FIELDS: SEPTEMBER OUTPUT.

Another Decrease—Lowest Returns for any Month This Year.

As was only to be expected in the circumstances, the output from the south-western diamond fields for September again shows a falling-off. Returns were registered from twenty-nine areas, making a total of 2,104¼ carats, valued at £6,052. The figures for the preceding month were 2,277¾ carats, value £6,623 3s. Appended is a summary of the various fields producing, with their respective totals:—

	Carats.	*Value.*		
Bloemhof	595¼	£1,495	16	0
Kameelkuil	276¾	1,269	15	0
London	378½	1,051	8	6
Cawood's Hope	117¼	410	12	6
Dievedraai	112¼	320	18	6
Panfontein	110¼	259	12	0
Christiana	83	204	17	6
Kareepan 164	51¼	143	13	0
Eastleigh	29¾	135	5	0
Kromellenboog	34	107	7	6
Kuilfontein	56¼	97	10	0
Olivenfontein	21½	83	7	6
Klipkuil	12	64	10	0
Mooifontein	17½	59	15	0
Rietput	36¼	59	0	0
Doornbult	35¾	52	12	6
Homansvlei	26	49	0	0
Driekopjes, portion Vliegekraal	7¼	46	0	9
Diamantdoorns	11¼	11	0	0
Avondster	17¾	31	17	6
Rondevlei and Doornbult	15	£30	0	0
Modderkraal	10¼	26	0	0
Goedehoop	7	23	12	6
Koppiesvlei	13½	23	7	6
Schweizer-Reneke	8¼	20	0	0
Kareepan 137	2¼	13	0	0
Goedgenoeg	7	8	10	0
Maroetjesfontein	1	8	0	0
Zwartlaagte	3¼	3	10	0
	2,104¼	£6,052	18	0

NINE MONTHS' TOTALS.

For the nine months ending September the output has been as follows:—

	Carats.	*Value.*		
January	3,063¼	£12,348	5	0
February	3,838	16,167	2	9
March	3,860¼	18,159	0	0
April	1,196¼	18,115	6	6
May	1,226½	18,738	18	0
June	3,549½	15,984	17	6
July	1,695	19,234	3	6
August	2,277¾	6,623	3	0
September	2,104¼	6,052	18	0
	31,816¾	£131,723	11	0

PATENTS AND THE WAR.

The New British Act Not a Vindictive Measure—Manufacturers' Position Explained—Some Points Elucidated.

(By A. A. THORNTON, Fel. C.I.P.A)

In the following article a plain explanation is offered of the position of manufacturers in regard to patents in the United Kingdom, and the position in South Africa will doubtless be assimilated to it by the Union Government in due course.

According to the popular idea the Imperial Parliament has recently passed a temporary Act whose principal object is to ensure the wholesale unconditional revocation of British patents owned by the subjects of countries with which we are at present at war. It is difficult to find anything, either in the Act or the rules, to justify such an interpretation of a measure passed to give effect to rules of expediency, obviously formulated to meet difficulties which have arisen and will continue to arise as the result of the present conflict. Parliament is being applauded in some quarters because it is supposed to have passed a vindictive measure, whereas there is little doubt it has not done, and never intended to do, anything of the kind. The keynote of the measure is expediency certainly not vindictiveness and a careful consideration will show that the authorities have had justice and even generosity to our alien enemies very much in mind. Except for this measure many patents belonging to alien enemies would become void automatically and many applications for patents would have to be abandoned and become abortive because their alien owners are prevented from paying the renewal and other fees and doing those many acts in connection with patent practice and procedure the time for which is limited by statute. Under this beneficial Act the Comptroller is giving power to "suspend proceedings" and "extend the times for doing any act or filing any document," and the fact that the measure under discussion is to endure for six months after the war has ceased appears to be clear evidence that there is no desire to take advantage of the alien enemy inventor. If further evidence were needed it is to be found in the procedure at presnt obtaining under this Act in the Patent Office.

TREATMENT OF ALIEN ENEMIES.

Applications in the names of alien enemies are being dealt with in the normal way until they are in condition for final acceptance; Proceedings are then suspended, and although it is quite clear that no grants will be made to alien enemies on these applications during the continuance of the war, there is little doubt that the grants will eventually be made. Even clearer evidence of our scrupulous fairness is to be found in the procedure to be adopted in the case of opposition to the grant of a patent to an alien enemy at the instance of a British subject. In these cases the notice of opposition is accepted, but, rather than take advantage of the enemy, all further proceedings are then suspended until after the war is over, and he is again in a position to defend himself. It is safe to assume that similar provisions are being made in all the belligerent countries, and after the war is over there is little doubt there will be a mutual interchange of courtesies and things will be restored as far as possible to their normal conditions. So far we have considered those provisions which benefit the alien enemy. There is, however, provision for "avoiding or suspending" a patent, etc., which has made the Act so popular and, as I believe so much misunderstood. It is said that many manufactuerers are already going to great expense to commence manufacturing articles and work processes protected by patent owned by German firms, in the belief that these patents are all or will be permanently evoked, and it is well that a warning note should at once be sounded and the misapprehension removed.

PERMANENT REVOCATION UNLIKELY.

There are provisions whereby upon payment of £2, an application can be made to the Board of Trade to order the "avoidance or suspension" of a patent or of a license granted under a patent. Care must be exercised in considering what is likely to be the true effect of this provision. That it will result in the unconditional permanent revocation of the patent or licence is inconceivable to me. It is well to consider some specific examples of how this provision may operate in practice. It must be remembered that when two countries are at war the subjects of the respective countries are entirely cut off from communication, and it is an act of treason for a subject of one country to transmit money to a subject of or the Government of another country even if such a course is practically possible. Thus, supposing a British subject to be a licensee under a British patent owned by the subject of a State with which we are at war, it is clear that difficulties might at once arise. For instance, it might well be, and frequently is, a term of the licence that the licensee pays to the patentee by way of royalty a certain sum of money on certain specified dates, and failure to pay this sum results ipso facto in the revocation of the licence. In such a case unless some such mesure as that under discussion existed to meet the abnormal circumstance of war, the licensee who might have spent thousands of pounds upon plant and other necessaries to work with the licence—would be faced with the commission of treason on the other hand or the revocation of his licence on the other. The position after the war is over is the only difficulty. Conceivably in such cases the Courts of this country would be oble to protect him, but the passage of this Act renders his position perfectly secure -the licence can be "avoided or suspended."

A MANUFACTURING EXAMPLE.

Similarly a British manufacturer might want to commence manufacturing some article the subject of a patent owned by an alien enemy. The former cannot negotiate for a licence or to purchase the patent, and although he might manufacture perfectly safely during the continuance of the war seeing that the alien enemy is denied recourse to our civil Courts by international law, and could, therefore, duing that period neither sue for damages nor for an injunction—his position at the conclusion of hostilities might be extremely difficult. The present arrangements provide a means of relief, since he can apply for the "avoidance or suspension" of the patent, and would doubtless succeed in his application. It will be noticed that the authorities have power to make "conditions," and it is unlikely that they will ever revoke a patent unconditionally. Conceivably the person applying for "avoidance or suspension" will be asked what terms he would have been prepared to offer the alien owner had a state of war not existed, and if the terms stated were reasonable "avoidance or suspension" of the patent might be allowed during the continuance of the war on "condition" that at the termination of hostilities he offers to continue working on those terms. At the conclusion of the war the alien owner would thus be faced with either accepting the terms offered or getting nothing.

"AVOIDANCE" NOT GENERAL.

It should be noted that "avoiding" a patent does no necessarily mean rendering it unconditionally void as most people seem to imagine. If that were so it would be obviously unfair since it would mean that while one manufacturer might go to the trouble and expense of getting the patent revoked, every other manufacturer would benefit without expense or trouble, and thus the initiator of the proceedings would benefit less than his rivals in trade. It, therefore, seems reasonable to assume that the avoidance may only be ordered in respect of the particular person or persons making the application, and if the war continues for any lengthy period and there are a number of persons making applications in respect of the same patent, the later applicants may not succeed on quite the same "conditions" as the initiator. At any rate, they ought not to, seeing that the initiator might by his enterprise, expense and trouble create a demand which all his rivals might then rush to supply.

OTHER CONSIDERATIONS.

Numerous other considerations arise which is is impossible to deal with now, such, for instance, as the position of the British owners of German and Austrian patents, but my object will have been achieved if this article results in the British manufacturer considering what his position is likely to be at the conclusion of the war before he definitely launches out into a field of enterprise in which he may not be allowed to continue. In any case, before deliberately infringing a patent he will be well advised to make his application for "avoidance or suspension" and thus find out all about the "conditions" which the authorities have power to and doubtless will impose, and he must not forget that the Board of Trade which gives him his position reserves to itself the right "in their absolute discretion" to take it away from him a disadvantage of the Act which is possibly more apparent than real.

[Since this article was written the writer's forecast has received official confirmation.]

Brakpan Mines

The results of the operation of the Brakpan Mine last month were as follows.- Stamps working, 140; running time, 28 days; ore crushed, 53,400 tons; tube mills working, 9; ore hoisted, 61,032 tons; ore from dump, nil; waste sorted, 12·34 per cent.; fine gold declared, 17,392·08 ozs.; value declared, £73,157, equal to 27s. 4·80d. per ton milled; working costs, £47,285; equal to 17s. 8·29d. per ton milled; working profit, £25,922; equal to 9s. 8·51d. per ton milled.

Mr. Gustav Imroth and Mr. W. McC. Cameron have returned to the Rand.

Rhodesian Section.

LATEST MINING NEWS.

Rezende Mines—Lonely Reef—The Turkois—Bell Reef—Tati Output—The Oil Factory—The Position of the Chartered Company.

The directors of Rezende Mines, Ltd., have declared an interim dividend in respect of the year 1914 of 1s. 3d. per share, less income tax.

* * * *

Below are particulars of the output of gold from the Lonely Reef mine for the month of September:—Mill ran, 25·02 days; crushed, 4,640 tons; yield of fine gold, 649·139 ounces; value, £2,728 5s. 1d.; slimes treated, 4,640 tons, yield of fine gold, 2,544·189 ounces; value, £10,697 3s. 8d.; total recovery of fine gold, 3,193·328 ounces; total value, £13,425 8s. 9d.; estimated profit, £5,425.

* * * *

The Goldfields (Rhodesia), Ltd., have given instructions for the whole of the machinery and plant of their Turkois Mine, at Shagari, to be dismantled and brought into Gatooma and entrained. Its destination is not, at present, known, but it is believed it is going to one of their smaller mines. Shagari has been looking forward to the Turkois restarting, and when the news got abroad that the battery and plant was to be removed, it created somewhat of a shock, till some one stated that it was on the cards that, when the company resumes operations at the Turkois, they will instal a larger battery. It is reported that Mr. E. A. McDowell, of Duchess Hill, has bought Mr. B. C. Munro's Merdale Mine, near Duchess Hill. There have been several other sales of mining propositions.

* * * *

The improvement shown by the recent monthly statistics relating to the value of the Rhodesian gold output is partly attributable to the fact that the reduction plant of the Bell Reef Development Company commenced its trial run in February and has since been dealing with a gradually increasing quantity of ore. Whereas in April 1,933 tons were treated for a gross yield of £2,956, last month 3,684 tons were crushed and yielded gold to the value of £6,669. In June higher grade material was dealt with, 3,182 tons yielding £7,699. It is hoped shortly to be running the plant at its full capacity of 4,000 tons a month. Meantime, the directors' report, just issued, shows that at the end of the last financial year (31st March) the ore reserves were estimated at 56,788 tons, of an average value of 12·4 dwts. per ton, equivalent to fourteen months' supply on the crushing basis above mentioned. The position in this respect might well be stronger. Little development was done during the period covered by the directors' report, the erection of the reduction plant having received chief attention, but now that crushing is in progress development should be pushed ahead with the object of augmenting the ore reserves. Like more than one other Rhodesian concern, the Bell Reef when it started crushing had a debt to clear off. It borrowed £30,000 from the Gold Fields Rhodesian Development Company, and then £20,000 more, making a total of £50,000 due to that company. It will take some time to pay off this loan, so that although the Bell Reef is now a gold producer the shareholders need not yet indulge in dividend estimates.

* * * *

The following is a return of the gold and silver produced in the Tati district during the month of September: Lady Mary Mine (J. Marnoch): 5-stamp mill ran 28 days, crushing 184 tons, yielding 279 ozs. fine gold, 92 ozs. fine silver, value, £1,181 18s. 11d. New Somerset Mine (tributor, T. W. Angus): 5-stamp mill ran 15 days, crushing 125 tons, yielding 46 ozs. fine gold, 4 ozs. fine silver, value £197 7s. 8d. New Prospect Mine (Southern Section): Tributor, T. H. Butler (estate of): 5-stamp mill ran 27 days, crushing 450 tons, yielding 85 ozs. fine gold, 7 ozs. fine silver, value £351 12s. 6d. Cyanide: 574 tons treated, yielding 92 ozs. fine gold; 9 ozs. fine silver; value £384 13s. 8d. Wells Reef (tributor, R. Aserman): Clean-up, 5 ozs. gold; 1 oz. silver; value, £20 13s. 5d.

* * * *

It is authoritatively announced that the oil factory, in course of erection by the B.S.A. Company, will be completed in ample time for next season's crop. Owing to the war there has been some slight delay in the shipment of the machinery, but this will not prevent the factory being in working order before our next crop is ready. This (says the *Agricultural Journal*) should be welcome news to many farmers who have been anxiously awaiting definite information before deciding to plant any considerable acreage of oil crops. Further information regarding this subject may be had on application to the Commercial Representative, B.S.A. Company, Bulawayo.

* * * *

A shareholder in the Chartered Company submits the following ingenuous suggestion:—

> Everyone realises that sooner or later Rhodesia must be taken over by the Government. It is only a question of price. The Government will never have a better opportunity than now exists. I am fully aware that the shares have changed hands at 12s. for cash since war was declared, but this is an absolutely ridiculous price. Any attempt to purchase a block of shares on the open market would send the price up by leaps and bounds. Almost every speculator who dabbles in shares owns a few Chartered. Is it possible for the Government to say to the shareholders: We will give 20s. per share for British South Africa shares, the offer to stand good for one month? Many shareholders would accept because the cash obtained would go to relieve their open account. It would give relief to the Stock Exchange position.

The above suggestion is based on the common fallacy of identifying the Chartered Company's administrative with its commercial functions. If, and when, the Administration of Rhodesia is taken over by the Government, the Chartered Company will only receive compensation for the public works, buildings, etc., which may be transferred and the value of the shares will not enter into the question at all. The Chartered Company will remain in being (just as the Niger Company has done), but as to whether it has any rights over the unalienated lands of the colony is a moot question as to which the Judicial Committee of the Privy Council has still to hear arguments and to give its decision. If the whole of the unalienated lands are found to belong to the Chartered Company—a finding which shareholders would be unwise to count upon prematurely—then there might be something to say for our correspondent's suggestion. But as it is there is no reason whatever why the Government should signal out Chartered shareholders for a piece of pure philanthropy not to be vouchsafed to other speculators.

Globe and Phoenix in September.

Mill: Tons crushed, 6,104; yield, 7,529·02 ozs. In addition to this, 344·10 ozs. has been placed to reserve. Concentrates: Tons treated, 256; yield, 468·36 ozs. Sands: Tons treated, 5,511; yield, 1,264·69 ozs. Slimes: Tons treated, 1,913; yield, 352·54 ozs. Total value, excluding reserve, £40,400 16s. 10d.

Correspondence and Discussion.

Comments on Questions Arising in Technical Practice or Suggested by Articles in the Journal—Views, Suggestions and Experiences of Readers.

Voluntary Civilian Training Association.

PROGRESS OF THE MOVEMENT.

To the Editor, *South African Mining Journal.*

Sir,—Another branch of the Voluntary Civilian Training Association was formed at Roodepoort under the chairmanship of the Mayor. The utmost enthusiasm was evinced at the first meeting which was addressed by Mr. Kenneth Austin, M.E., and by Captain Girdler-Brown, the popular manager of the Roodepoort United Gold Mines. It was arranged that every mine in the neighbourhood should be represented on the Council, and steps were taken to start drilling at once. This movement is rapidly gaining ground, and the number of men who are training to " Be ready " (the motto of the V.C.T.A.) to take up the work of police—defence of towns and mines—and making up the natural wastage which will take place in the forces in the field, is rapidly running into substantial thousands. On Tuesday evening last, notwithstanding the pelting rain, a very patriotic meeting was held at Brixton (Johannesburg) for the purpose of forming a branch of the Voluntary Civilian Training Association for the district. The meeting was addressed by Mr. Kenneth Austin, M.E., and by the Rev. S. Weaver. Mr. Austin gave a complete history of the movement, and urged all those who could give money and time to the arduous work of organizing, to come forward and prove their loyalty by works. He pointed out the rapid organization which had taken place in all parts of the country and stated that the membership was at the present time well over 10,000. Several veteran instructors of experience came forward to undertake the drilling of recruits and the greatest unanimity prevailed in the meeting in making a determined effort to train so that every member would " Be ready " to undertake any duty which the Government might call upon them to do.—Yours, etc.,

H. H. FISHER, Secretary.

Mine Workers and Volunteering.

DUTY—ITS DIGNITY.

To the Editor. *South African Mining Journal.*

Sir,—At Krugersdorp, on Tuesday, Major Creswell, M.L.A., inaugurated his, newly fledged military honours by not merely advocating a perfectly patriotic and legitimate support of the Government's action with regard to German S.W. Africa, but by flagrantly going out of his way to utter an uncalled for diatribe against the " mealy-mouthed and pernicious doctrine, preached throughout the mines, that every man working on the mines is doing an equal service to his country as were he in the field." Major Creswell's admirable ardour has evidently run away with his discretion. He, perhaps above all men, should know that there are thousands of men, even on the mines, who would gladly lay down their lives—if necessary—for their country; but he should also know that those who remain at their work are yet doing their duty; that even if hard graft does not carry with it the glamour of war, and uniforms and bugle-calls, or even of addressing and influencing one's fellow-men, it yet equally serves one's country; and we have the very highest authority for the statement that " greater is he who conquereth his spirit, than he who taketh a city." There are hundreds of quite as ardent patriots as Major Creswell on the mines, and in the mines town offices, who are eating out their hearts in their desire to meet the common foe, but to call their brave determination to overrule such desire by the more truly patriotic decision to stick to their less spectacular posts and keep the great gold mining industry going—and on which the Imperial Chancellor is reckoning—a " mealy-mouthed and pernicious doctrine," is surely a new creed for the erstwhile champion of labour. May I, like the Cambridge undergraduate, ask Major Creswell, " Why this thusness "?

The duty set us to conquer over our clever foes cannot be wholly accomplished except by the *united work of all*. The italics are mine. To understand our duty and to regulate our work, in accordance with it is the true way to state the problem. Major Creswell should, therefore, go on doing his duty without further criticism. If he will, his work would be the more appreciated by one and all of us.—Yours, etc.,

JAMES CUMMING.

[We have deleted some ultra-forceful expressions from this letter. Ed.

Rand Geology in Terms of Tactics.

To the Editor, *South African Mining Journal.*

Sir, I see in your last issue that, for some reason or other, Mr. Bleloch is coming into action again with a fresh lot of theories on the Rand's right wing, which extends from Grey's Mynpacht to the South Randfontein Deep, but he will find that Nature has entrenched Black Reef series there in such an impregnable position, under my command, that his Langerman's Kop, Reitfontein, Van Ryn—Modderfontein formations all rolled into one will have no earthly chance of dislodging it The Rand's left wing from Boksburg to Daggafontein is also well protected by Black Reef, and not Main Reef, as some people think, so what chance can theories have against such facts.—I am, etc.,

SCOTT ALEXANDER,
" Rand Stratigraphist."

Johannesburg, 21st Oct., 1914.

City Deep.

Development at the City Deep in the quarter ended June 30 was as follows: -Main Reef: Distance exposed, 1,525 feet; width, 36 inches; assay value, 10s. 11d. Main Reef Leader: Distance exposed, 3,165 feet; width, 19 inches; assay value, 109s. 7d. No. 1 main vertical shaft was sunk 162 feet, and a station on the 13th level started. The circular ventilation shaft was sunk a further 439 feet, and its total depth is 1,383 feet. The east incline is now down to the 14th level. The amount expended on construction account for the quarter was £18,780. The balance to be expended on authorised work is £51,885. The interim appropriation account shows a credit balance of £169,961, but this does not represent the amount available for distribution. The capital expenditure for the six months ended 30th June, 1914 (£40,429 on development and equipment and £3,280 in respect of undermining rights annuity, less credit for stands sold, £16) has not yet been appropriated. The amount to be transferred from appropriation account will not be determined until the end of the financial year and after it has been decided what further dividend is to be declared.

May Consolidated.

Working expenditure. £26.706 7s. 0d.; 13s. 11.8d. per ton milled. Balance—Working profit, £1.439 13s. 6d.; sundry revenue, £118 9s. 2d. Total, £1,558 2s. 9d.; 9·8d. per ton milled. Revenue, £28.264 9s. 8d.; 14s. 9.6d. per ton milled. Owing to an increase in the native labour force, a higher tonnage milled is recorded as compared with the previous quarter's results. The value of gold recovered was lowered by 1 9·5d., but owing to the working costs having been reduced by 2 1.8d., the working profit showed an increase of £1.238.

MAGNOLIA METAL.
OFFICIAL TESTS AND THOUSANDS OF TESTIMONIALS PROVE THAT
FLOWER BRAND MAGNOLIA METAL
HAS LOWEST COEFFICIENT OF FRICTION. STANDS HIGHEST SPEEDS AND PRESSURES.

TRADE MARK TRADE MARK

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Engineering Notes and News.

The "Globe" Tube Mill Lining.

Tube mill linings of the type devised by Mr. A. R. Globe, the assistant manager of the Hollinger mine, on the Porcupine goldfield, are used at one or two other mines in Ontario. This lining is based on the same principle as the well-known El Oro lining; that is to say, deep iron plates having channels into which pebbles wedge themselves, forming a lining which prevents wear of the iron. The difference is that the channels run around the mill, whereas in the El Oro type they run longtitudinally from one end of the mill to the other. The taper is arranged so that the turning of the mill wedges the pebbles more and more firmly into their places. Tube mills equipped with this lining have been in use for some time at the Hollinger mine, where they are said to be giving about three months more service than the El Oro lining. It is used also at the Cobalt Lake mill, and one mill is being equipped with it at the Dome mine, Porcupine.

An Ideal Electric Air Hammer Drill.

This machine, which, if all that be claimed for it be true, should fill a long-felt want, is essentially a hammer drill, as distinguished from a drill having a reciprocating piston which carries the steel bit with it. In this case the bit is stationary and is struck successive blows by a reciprocating hammer with the intervention of an inert anvil block between them. The principle of operation of this drill cannot be said to be new, the present device being a development of a type which has been known for several years. Instead of actuating the hammer by direct air pressure from some constant source of supply, as in the more familiar types of pnuematic hammer or other drills, this machine may be said to be its own compressor. The cylinder in which the hammer piston works is elongated behind this piston, and in this elongation of the cylinder there is an air compressing piston which is reciprocated by connection with a crank whose shaft is rotated, through suitable reducing gears, by an electric motor, all the apparatus here enumerated being integral parts of the complete drill as actually set up and operated. The compression of the air for each hammer stroke is done in the end of the cylinder to the left of the compressing piston. Assuming that the hammer piston has just struck its blow upon the dolly pin and that the compressing piston is approaching it, the air between the pistons running through passages at the side to the upper end of the cylinder. When the compressing piston has completed its stroke, closely approaching the hammer piston, and commences its return stroke the hammer piston follows it, being driven in that direction by the atmospheric pressure behind it. During this movement of the pistons the air is being compressed and this compression continues until when the stroke is nearly completed holes placed in a ring around the cylinder are uncovered by the advancing piston and the compressed air suddenly shoots between the pistons causing the hammer piston to strike its blow. No valve motion is required, the air distribution being accomplished by the successive uncovering by the pistons of two rings of holes around the cylinder. Advantage is taken of the expansive force of the air in making the hammer stroke so that, barring the inevitable leakage, the air may be claimed to be applied economically. Although the hammer must make a stroke for each rotation of the crank shaft the speed of that rotation must be limited by the sufficiency of the atmospheric pressure to return the hammer piston. A maximum working air pressure of about 60 lb. gauge is reached in working. The drill is fitted for the use of hollow drill steel and wash water continually supplied. Water may be delivered from pressure lines when convenient, but there is a small pump on the main gear spindle and the discharge is piped to the drill chuck chamber. The steel is rotated a fraction of a turn after each blow, the chuck having a ratchet connection to a small crank arm on a long shaft running to the motor gear, connecting with the latter by spur pinion and gear.

A Modern Rhodesian Reduction Plant.

At the Bell mine in the Gwelo district of Rhodesia, belonging to the Bell Reef Development Company, the reduction plant was started up in February last. The ore is first crushed in an ordinary drier in order to get rid of any moisture previous to its reaching the two Krupp ball mills. After being crushed here to 600 mesh the ore passes to two 44 rabble Edwards' furnaces. The roasted ore is then brought into contact with cyanide solution and is further ground to a slime in a 22ft. by 5½ft. tube mill. Thence it is conveyed to agitators, and after agitation the pulp is delivered to two five-ton Dehne filter presses, the solution then passing on to the usual clarifiers and extractor boxes. The plant is designed to treat 4,000 tons per month.

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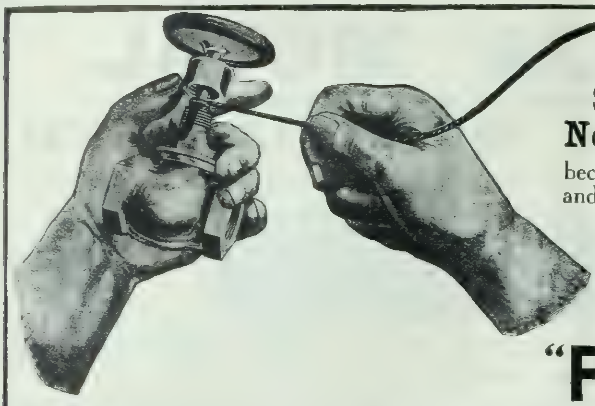

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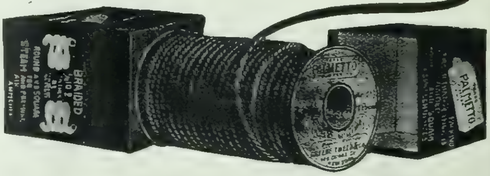

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ELECTRIFICATION OF RAILWAYS IN SOUTH AFRICA.

A Matter of "Everyday Engineering"—Individual Study of Each Project Required—Question of Power Supply.

(By BERNARD PRICE, Vice-President S.A.I. of E.E.)

I feel that we are all indebted to Professor Buchanan for having brought before us a subject which is of immense importance at the present time, and one which is of special interest to this country. The engineering problems which it embraces form a special branch by themselves, and I feel that as I have but a casual and general knowledge of this branch of modern engineering, I am not competent to usefully criticise the many details which are dealt with in the paper. Speaking, however, as one who has followed in a general way the progress made during the last ten years, I think it can be asserted, without fear of contradiction, that railway electrification has now advanced far beyond the experimental stage. One has only to glance at a tabulated statement of the numerous schemes which have been successfully completed, and the increasing number of new projects undertaken year by year to realise that railway electrification on a large scale, and in many instances under the most difficult conditions, has now become a matter of every-day engineering. In America and on the Continent the electrification of railways is proceeding by leaps and bounds. In England, several important suburban schemes have been in successful operation for a number of years, and several new projects are in contemplation. Several important schemes are nearing completion in the various Colonies and in foreign countries. In my opinion, the next few years will see the electrification of many lines in and around London, and this development will be hastened if the numerous existing power undertakings are consolidated in the manner now under consideration. It seems possible that at last a really economical and up-to-date scheme for bulk supply to London may mature, and if this can happen, an unique opportunity will offer itself for establishing a world's record. Whilst the art of railway electrification has undoubtedly developed well in advance of the experimental stage, the very nature of the problem renders it essential that each individual project should be considered on its own merits and should be attacked as its own particular conditions and difficulties demand. The problem is, in my opinion, essentially one upon which the advice of an expert should be sought: as it is only those who are fully informed regarding latest practice and who have full experience of the working results obtained on other schemes, who are competent to frame reliable estimates and to form correct decisions regarding both the financial and engineering features of the scheme. The first step on a problem of this kind is to obtain a comprehensive report dealing with the financial and engineering aspects of the particular project. This report would show the funds required, and the financial results to be anticipated, and it would also make definite recommendations regarding the type of system to be adopted and the organisation required for dealing with the business. If, as an outcome of such a report, it were deemed advisable to proceed with the scheme, advice should be taken regarding the detailed lay out of the scheme, the specification of the plant, the choice between various proposals, the testing and approval of manufacturers, the installation and setting to work of the works, and last, but by no means least, the organisation and equipment of the departments required for the operation and maintenance of the entire electrical equipment. Questions of this kind can be properly dealt with only by those who have made a special study of this branch of engineering and who have been able to acquire experience as to the difficulties which have arisen in other schemes, but, of course, such expert knowledge must be supplemented by full data regarding local conditions obtained either through local channels or by investigation on the spot. In considering any scheme of electrification, and I have particularly in mind any scheme for electrifying the lines in this district, the question arises as to whether it is better to generate the power from a new plant or to purchase it from an existing undertaking. The remarks I have to make on this point are in no way interested, I merely wish to show the general considerations which govern the matter. Given average conditions it should, in my opinion, be profitable to the railway to purchase power for the reasons which I will mention, but of course special factors may apply in some cases, which would turn the balance in the other direction. A railway load, when superimposed upon the load curve of an existing supply, will generally result in an increase in the load factor of that supply. In other words, the increase in generating plant capacity required on an existing system for meeting the railway load will be less than the capacity which would have to be provided if the supply were given from a new and separate station. I show a typical load curve for the electric system of the power company operating in this district. The load rises rapidly between the hours of 7 a.m. and 10 a.m., and again falls away rapidly from 3 p.m. to 6 p.m. Unfortunately I have no data which will enable me to estimate precisely the load curve for the supply which would be demanded by the railway service along the Rand if this were to be electrified, but I take it that any such supply would be heavier between 6 a.m. and 10 a.m. and between 4 p.m. and 7 p.m. than at other times. Unless the heaviest demand were to occur between 11 a.m. and 2 p.m. some advantage would accrue by partially filling up the valleys in the existing load curve, and you will note that even over the mid-day period there is a small valley between 12 noon and 2 p.m., which might help to absorb a portion of any lunch hour peak on the railway supply. In practice, therefore, an existing undertaking, such as the local power company, should be able to meet a railway load without increasing its generating plant capacity by the full amount of the peak load, and in addition to this it must be remembered that it is always cheaper to extend an existing station than it is to equip a new one, as many preliminary and initital expenses are avoided. Then again, an existing concern, which is several times as large as that which would be required for meeting the railway supply alone, can adopt a larger and therefore cheaper, as well as a more efficient, unit of generating plant. Both the capital cost per k.w. and the operating and maintenance costs per unit supplied are considerably reduced if the number of generating sets can be reduced by adopting large machines. Again, the percentage of spare plant necessary for reliable service is less on a large power scheme than it would have to be on a smaller and separate station. To be safe we ought to have at least two generating sets in reserve, because when any one machine is out of commission for overhaul a further machine should be standing by. On a large scheme comprising, say, 15 large

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*Being a contribution to the discussion on Professor Buchanan's paper read before the S.A. I. of E.E.

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generating units, it is clearly possible to have three sets in reserve without reaching more than a small percentage of reserve capacity, but when equipping a single station a similar result could only be obtained by installing a relatively large number of small sets, which would be ruled out of court on account of capital cost, inefficiency in coal consumption and increased operating and maintenance charges. The comparison in regard to cost of connecting up from the generating station to the various substations would depend entirely upon local conditions. As it happens, in this district the power company is already possessed of a transmission and distribution system extending over the whole length of the Rand, and it is located in close proximity to the railway routes throughout the length. The choice of frequency, if an alternating system were adopted, is another factor which would influence the comparison. If a separate station were provided the plant would, of course, be designed for a frequency to suit the railway equipments, and this frequency would, no doubt, be considerably lower than that adopted by most existing power undertakings. On the other hand, whether an alternating current or a direct current system were adopted the rotary plant which would have to be installed in substations for converting the frequency or for converting to direct current, can readily be designed to take a leading current from the system which is furnishing supply, thereby benefiting the power scheme by correction of its power factor. If a separate station were installed for an alternating system, no correction of power factor would be obtainable unless special additional plant was installed for that purpose. If the direct current system were adopted the rotary machinery would, no doubt, be designed to obtain unity power factor on the generating station. It is clear, therefore, that by designing substation plant so that it will take a leading current, an existing concern could obtain some added advantage even in the case of a direct current scheme by reason of the correction of the power factor of its existing business. Lastly, it must always be borne in mind that the money for any scheme has to be found before the work can be undertaken, and it would not infrequently happen that the elimination of expenditure upon a new power station and transmission system would be a financial consideration of great weight. Any capital not invested in power generating plant and transmission system would be so much money released for investment in other national schemes, whether they be in the nature of railway electrification or the development of the numerous resources of this rich country.

A Popular Drill.

Stimulated by the special requirements of the Calumet and Hecla Company, after much experimenting during the past three years, strength and power being the two most important factors in the work, there has developed a drill that is practically adapted to the Calumet conglomerate. The piston for the "Butterfly" Ingersoll-Rand drill has been increased from $2\frac{3}{4}$ ins. to $3\frac{1}{8}$ ins., so as to give the required power, and the weight and strength has been correspondingly increased. This drill is known as the "D 113." It is best operated by two men. The diameter of $\frac{7}{8}$ in., instead of $1\frac{1}{4}$ ins. is being tried here for the steel, or drills proper, of the Leyner-Ingersoll machines; the hexagon steel being provided with a collar and a special chuck, while at the Copper Range Con. it is equipped with lugs. The "Baby" Leyner, "26," is also being tested out here. There are now about 100 of these drills in use at the Quincy, together with over 100 Jackhamers, which at that mine are increased in shells and attached to posts, and are used for almost any drill work. They are coming into favour at the Mass and Victoria. The Leyner-Ingersoll "18," however, has become the standard for the Amygdaloids in almost all of the mines in the Copper country.—"Min. and Eng. World."

In view of the extensive damage which has been done by the German 17-inch siege gun, it is not surprising that there should be much public interest here in regard to the nature of this new weapon and its working arrangements. According to details published, the gun, which is popularly known as the "Brummer" and is operated only by engineers specially furnished by Krupps, is discharged electrically from a considerable distance, its action being such that the operator cannot remain in the immediate vicinity. Its projectile weighs 950 kilogrammes (approximately 2,100 lbs.), and on leaving the gun describes a parabola covering a distance of 20 kilometres and rising to an altitude of 1,200 yards. It is added that the shell in exploding emits deadly gases. The Germans are reported to be manufacturing now a gun of 20.03 inches.

New Patents.

356. Henry Edward Douglas Drake.—An improved ox yoke.
357. Edward Bignell.—Improvements in piles.
353. Weldless Couplings, Ltd., and Isaac Henry Pilot.—Improvements relating to weldless couplings for railway wagons.
359. John Wilkinson Kirkland.—Improvements in controlling means for electric motors.
360 John Wilkinson Kirkland.—Improvements in metallic resistance for use in the speed controlling means of electric motors.
361. James Hardgrave Shekleton.—Improved appliances for locking nuts or bolts.
362. William Rowley Brennan.—Improved lock for doors.
363. William Arter Sparks.—Well drill jars and method of making the same.
364. Percy Alexander McHardy. Improved means for use in attaching fencing wires to standards or droppers.
365. Frederick William Lace and William Patrick Cowan.—Improvements in water supplying means for rock drilling machines to prevent the formation of dust when drilling.
366. Frank Russell.—Clamp for securing repair gaiters on pneumatic tyres.
357. John Thomas Ditchfield.—Improvements in dry earth closets.
368. Edward Dossor.—Warning signal device for mine hoisting machinery.
369. Wilhelm Mauss.—Improvements in centrifugal separators of the planetary type.
370. James Edward Oliver. Breathing protector.
371. Cyril Durham James Dunning. A system of wireless telegraphy whereby the use of highly elevated wires as an aerial is unnecessary.
372. Frederick Wilfrid Scott Stokes.—Improvements in or relating to rollers for sluice gates and the like.
373 John Allen Capp and Edgar Francis Collins. Improvements in methods of coating metals and apparatus therefor.
374. Chester Newell Moore. Improvements in resistance elements.
375. Irving Langmuir. Improvements in electrical discharge apparatus.

Finance, Commerce, and Industries.

War and Food Supply.

The South African *Farmer* (Port Elizabeth) comforts its readers with a story of good times coming which certainly has considerable foundation, provided the farmers rise to the occasion. The writer remarks: " One point to be borne in mind is this, that there will be a shortage of livestock in Europe. Before the war Germany possessed 20,630,000 head of cattle, 22 million pigs and about eight million sheep. In England one-third of the cattle, sheep and pigs stood for seven months' supply without importing, and we may assume that one-third of the livestock of Germany would represent three months' supply, since the population is larger. One ox is reckoned to supply food for 40 men, and Germany's 20½ million head of cattle would feed 824 million men one meal, or six million men for 137 days. We see then that the number of livestock would be enormously reduced to feed the army and the people. There will, as one result of the war, be a great European demand when the peace is restored for the thoroughbred cattle; there will also be a bigger demand than heretofore for mutton and for wool." We trust that South African farmers will not only read, but attempt to benefit by the lines quoted above.

* * * *

Cheaper Prices for Galvanised Iron.

The removal of the export embargo on galvanised sheets has not meant any great liberation of trade, writes a Birmingham correspondent. Demand is sluggish, the financial condition of some of the principal markets being very unsettled. Moreover, the high price, necessitated by the stringency in regard to spelter and other increases in productive cost, discourages business. Generally, it may be said, however, that prices are down 10s. to £1 per ton. To-day's prices for 24 gauge corrugated sheets f.o.b. is £14, and for the home trade £14 10s. is asked. The spelter difficulty has been relieved by supplies from the United States. There is still great irregularity in the price, but delivery can be obtained on easier terms than seemed probable a few weeks ago. Spot virgin spelter is this week quoted £29 on the London market, while American metal is offered at £26 10s at English ports. Re-melted spelter commands £25 10s. on the London market, and hard spelter commands £21 10s. to £22. It is difficult accurately to appraise trade conditions in galvanised sheets at date—the experience of makers varies so widely. Some firms are busily employed on Government orders, but with that exception not much trade is being done. Until finance runs in less turbulent channels the overseas markets will, there is great reason to fear, be of small use to the galvanisers, and as these are the chief customers of the trade, it is easy to account for the current serious want of employment at the works. Black steel sheets for use by the galvanisers are in quiet demands, and prices have dropped to about £8 5s. for doubles. The galvanised iron makers are much interested owing to the important effect which it may ultimately have on the supply of native spelter in a proposal which has just been put forward by the directors of the Zinc Corporation to erect its own zinc smelters instead of being dependent, as hitherto, upon supplies from the Continent. The chief difficulty confronting the project is the considerable size of the works required and the corresponding amount of capital which would be necessary for their construction. Until the war the largest part of the production of spelter for European consumption has come from Germany and Belgium. It is this week believed that the Germans will have taken good care to demolish the Belgian smelters, and it is also reasonable to suppose that the German smelters will not escape intact.

* * * *

Wool Sales.

The Union Department of Agriculture, in its Press Circular No. 11, 1914, advises us that close of last week wool sales showed remarkable change for the better. In view of possible insufficiency cross bred wool to satisfy large army orders demand for longer stapled merinos and coarser kinds became accentuated. Opinion amongst trade here is that present values are fully as high as any we are likely to see for some time. As many mills are booked with army orders for six months ahead, it is considered safe to ship better got up twelve months wool but short six months not wanted except at low prices.

* * * *

War and Unemployment.

The Government labour report for September shows a total of 961 applications for employment. There were 987 in August. There was a decrease of 35 in Johannesburg, and an increase of 16 in Pretoria. The total applications from employers was 239, as against 233 in August. Employment was found by the Department in September for 283 persons against 213 in August. In discussing the state of the labour market, the report says: The hostilities in Europe were responsible for a check in August in the gradual increase in the number of white employees on the gold mines of the Witwatersrand. The building trades in all branches are very quiet, very few buildings of importance being constructed. The fact that plans are passed by the authorities is not a guarantee that the work will be proceeded with, as the approval of the plans holds good for one year from the date of acceptance. In the Cape there is a general tendency towards lack of full-time employment and a reduction of wages. The demand for coloured labour, however, is good, particularly for farm labourers. In Pretoria district 187 men are employed on relief works on provincial roads, an increase of 47 over the figures for August. The general verdict on

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the Pretoria conditions is that slackness prevails in all industries except those connected with the demands of the Defence Force, which are very active. Durban reports trade very dull in practically all directions. Kimberley reports that there is a general and widespread lack of employment, but much of the distress has been neutralised by the expenditure of the Mayor's relief fund on miscellaneous works of public utility. A tabulated statement at the end of the report states that out of 383 applications for work in Johannesburg, 127 were from handy-men and unskilled labourers, 90 from men wanting farm and gardening occupations, 76 wanting engineering occupations, and 76 wanting work in the building trade. Out of 207 applications received at Capetown, 58 were for work in building trades, and 44 for work in engineering callings. Notwithstanding the stress and distress disclosed by the official reports, from the various white labour inspectorates of the Union, they leave one with the impression that trade and industry are much better than could have been expected, and that in all probability the ultimate result of the war will be to stimulate and multiply South African industries, and to give us a sounder prosperity than anything known in the past.

* * * *

Iron and Steel Trade Conditions.

The monthly report of the British Steel Smelters' Association states that the condition of the trade continues to be satisfactory notwithstanding the war. The report goes on, however, to express the opinion that it would be very unwise for iron and steel manufacturers to adopt at this juncture any retaliatory measures towards consumers who, prior to the war, were obtaining their supplies from the Continent. There can be no doubt that the proper course for the trade to pursue now is to encourage business in all directions irrespective of what policy particular consumers may have pursued hitherto in regard to the purchase of their supplies.

American Trade and the War.

Financial America states that a commercial result of the European war and the opening of the Panama Canal is the formation of a Chicago corporation, with a capital of £500,000, to conduct an import and export trade at the expense of the belligerent countries. The company's first efforts will be in the Latin-American trade, with a line of steamers operating out of New Orleans and connecting with other lines at the Port of Colon.

* * * *

Associated Portland Cement.

For the past year the trading profits of the A.P.C. amounted to £454,100, as against £493,600, a decrease of £39,500, a smaller decline than might have been expected in view of the prolonged dispute in the London building trades. At the same time, the revenue from investments fell off from £133,100 to £109,200, a drop of £13,900, due largely to the fact that no return was received during the period from the company's investment in Mexico, owing to the disturbed state of that country. Substantial profits were earned by this subsidiary concern, but the unfavourable exchange rendered the declaration and remittance of a dividend inadvisable. Altogether the gross receipts were £63,500 down, but this was counterbalanced to the extent of £13,700 by the larger sum brought into the accounts. As regards the subsidiary undertakings, the works in British Columbia were finished in the early part of the financial year, but their operation has been hampered by the financial crisis in Canada, while the works in South Africa, in which the company is also largely interested, have only just been completed. Investments at cost and loans stand in the books at £1,850,900, as compared with £1,718,000 a year ago, but this additional outlay has evidently not yet become productive, and a substantial increase in revenue may be looked for when the South African, British Columbian and Mexican works are in full swing. Shareholders will note with regret

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the resignation of Lord St. Davids from the Chairmanship, but this will not interefere with the executive management of the undertaking, and allowing for a temporary slackening in trade, the extent of which no one can foresee, the company's position appears decidedly hopeful.

* * * *

Potash Supplies. Outside of Germany (and possibly, Spain) there is no known commercial supply of potash salts. If the German supplies are cut off during the European war, the agricultural world must either go without potash salts after the meagre supply now on hand is exhausted or bestir itself to find another adequate source of supply. Already the fertilizer journals report that small quantities of spot material are changing hands at sharp premiums. The situation is undoubtedly more acute than it was a few years ago.

* * * *

Farmers and the Union Railways. The extent to which modern appliances are being more freely used by the farmers of South Africa is strikingly illustrated by the tonnage of agricultural machinery and implements conveyed over the Union railways during 1913, 33,957 tons, as compared with 23,651 tons the previous year, an increase of 10,306 tons, or 43·6 per cent., and this result has been achieved during a period when the country has experienced a season of drought. Fencing material increased by 15,958 tons, or 21 per cent., over the tonnage conveyed during the previous year. There was a considerable increase in the tonnage of imported fertilisers, which advanced by 24,236 tons, or 98·4 per cent. The tonnage of South African fertilisers increased by only 2,046 tons, or 3·1 per cent. The increase in the locally-produced fertilisers is not a very large one compared with that of the imported article, but since Union the increase in the former has been a constant one, as compared with fluctuations in the tonnage of the latter. This is reflected in the following figures, showing the respective tonnages for the period 1910 to 1913 inclusive:—Imported fertilisers: 1910, 57,478 tons; 1911, 42,437 tons; 1912, 24,635 tons; 1913, 48,871 tons. South African fertilisers: 1910, 47,852 tons; 1911, 54,590 tons; 1912, 65,327 tons; 1913, 67,373 tons. It will be seen that in 1913, as compared with 1910, the tonnage of imported fertilisers decreased by 8,607 tons, whereas the South African fertilisers increased by 19.621 tons. The tonnage of wool, skins, hides and horns increased by 16,852, or 12·6 per cent., over 1912. This was mainly due to the improvement in the production of wool and mohair, which increased by 12,959 tons, and is the more satisfactory when it is remembered that a large proportion of the pastoral districts of the Union suffered from severe drought. South African sugar shows a decrease of 3,483 tons and imported sugar an increase of 3,241 tons, due apparently to the Indian passive resistance movement in Natal in the early part of the year. Imported grain increased by 45,819 tons, or 518·5 per cent., while South African grain decreased by 130,813 tons, or 19·7 per cent. This is attributed to the drought. Imported timber decreased by 12,917 tons, or 6·2 per cent.; on the other hand, the tonnage of South African timber increased by 49,431 tons, or 30 per cent. The increase is largely represented by timber for industrial and mining purposes in the Transvaal. As against a decrease of 462 tons in imported wines and spirits, the South African product shows an increase of 1,758 tons, or nearly 4 per cent. Fruit traffic increased by 7,526 tons, or 10·1 per cent. A feature of this traffic is the reduced number of claims now received for damage in transport or mis-carriage.

* * * *

Underwriting Vicissitudes and the Government. The depredations committed in the Bay of Bengal by the German cruiser "Emden" have given the Imperial Government their first taste of the vicissitudes of an underwriter's life. The losses arising out of the sinking of some dozen English merchant vessels in Indian waters have led to the first claims under the special war insurance policies issued by the Government since the outbreak of the European conflict, and while the loss now involved has not been disclosed, it is generally believed that practically the whole of the premiums paid for this class of protection have been swept away, with the result that any further claims are calculated to produce a deficit on war risk business, taken as a whole. It is true that in the meantime fresh premiums are still coming in, but these, of course, involve fresh risks which in their turn may necessitate heavy disbursements by the Government Department. Doubtless, when the Cabinet decided to assist in protecting British merchants and shipowners against war risks they were advised that the claims would probably exceed the actual premiums paid, this being in accordance with the views expressed by experts. On the other hand the effect of the timely action of the authorities has been to keep the British flag flying at a time when it was particularly necessary that the volume of the import trade of foodstuffs should be maintained at a high level. The achievement of this object, together with the avoidance of any excessive rise in the prices of domestic commodities, has fully justified the action of the authorities.

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Tin's Rising Price.

The price of white tin has somewhat improved, being £4 10s. higher than last week, writes a correspondent in Cornwall. It is unofficially quoted £137 10s. for Straits and £137 for English ingots. There is a tendency towards an increased price, as sellers are very reserved on the reports of a shrinking output, owing to the mines closing down, and a partial cessation of developments in many of those now working. The tin statistics for August showed a slight decrease in the stocks, the total visible supply of metal being 16,944 tons, compared with 16,966 tons at the end of July; but the significant feature of the figures is that the total deliveries for August amounted to only 4,272 tons, against 8,049 for July. A few months ago the total stocks in sight were over 20,000 tons. There is still a large quantity of black tin at the mines waiting for an improved market. It is believed, and probably with good reason, that the demand must shortly increase, owing to the many industries in which tin is needed, and especially in view of the calls likely to be made some time in consequence of the war. The present price is totally unprofitable to the great majority of the world's mines, and the conditions now existing, if long-continued, must result in curtailing the supply so seriously that abnormal values will be obtained later, owing to the scarcity thus brought about.

The annual report just issued by Messrs. Stuttaford and Co., Ltd., shows the net profit for the year to be £51,083, which the directors propose allocating as follows: To reserve fund, £10,000; final dividend of 4 per cent. on ordinary shares, making a total of 7 per cent. for the year; and carrying forward £19,486 to the next account.

The Union Department of Agriculture in Press Circular No. 10, 1914, states that owing to the falling off in the demand for fine short wool for which Germany has been the principal customer, farmers are strongly advised not to shear sheep with six months' wool, as is the practice in some districts, but to allow the fleece to remain for twelve months.

In Liquidation.

3897. The Irish Ham Store, Ltd., Johannesburg; by order of Court.
2908. Parktown Ice Company, Ltd., Johannesburg; voluntary.
87. "The Jumpers" Gold Mining Co., Ltd., Johannesburg; voluntary.
4030. The Transvaal Tanning Company, Ltd., Pretoria; by order of Court.
2162. Orangia Coronation East Exploration Syndicate, Ltd., Johannesburg; voluntary.
4423. The South African Farmers' Guide and Industrial Gazette, Ltd., Johannesburg; voluntary.

INVESTORS' DIARY.

FORTHCOMING COMPANY MEETINGS.

Oct. 28.—Rooiberg Minerals.
Nov. 10.—Johannesburg Consolidated Investment Company.
Nov. 16.—Nourse Mines; Mew Modderfontein.
Nov. 20.—Glynn's Lydenburg.
Nov. 27.—Consolidated Main Reef; Main Reef West.

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4000. Lamb, Raphaely & Co., Ltd., 45 Simmonds Street, Johannesburg.
2679. Horner & Company, Ltd., 268 Market Street, Pretoria.
4120. Atbur, Ltd., 101 Market Street, Piet Retief, Transvaal.
4059. Chancellor Diamond Syndicate, Ltd., 151-152 Stock Exchange, Fox Street, Johannesburg.
4103. Roodeplaat Diamond Mining Co., Ltd., 151-152 Stock Exchange, Fox Street, Johannesburg.
4335. Harrisdale Diamonds, Ltd., 151 152 Stock Exchange, Fox Street, Johannesburg.
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1507. H. & J. Israel, Ltd., 151-152 Stock Exchange, Fox Street, Johannesburg.
2303. Du Preez Consolidated, Ltd., 151 152 Stock Exchange, Fox Street, Johannesburg.
2560. Diamond Mining Investment Company, Ltd., 151-152 Stock Exchange, Fox Street, Johannesburg.
4058. African Mining, Finance and General Agency, Ltd., 95 96 New Stock Exchange, Johannesburg.
4258. The Rand Pawnbrokers', Ltd., Stand 274, 116 Commissioner Street, Johannesburg.
2957. The Premier Coal, Ltd., B. & T. Buildings, 68 Commissioner Street, Johannesburg.
3492. H. W. Allkin & Co., Ltd., 19 Sacke's Buildings, Joubert Street, Johannesburg.
1312. Transvaal Real Estates, Ltd., 151-152 Stock Exchange, Fox Street, Johannesburg.

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→ 3 ←
FACTS REGARDING THE
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WORTH REMEMBERING.

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2. **TRANSVAAL** Mines have spent 24 millions sterling on machinery and plant.

3. The **"South African Mining Journal"** is the **Official Organ** of the **Mine Manager's Association.**

Crown Mines, Ltd.

Development at the Crown Mines in the quarter ended June 30 was as follows:—Main Reef Leader: Distance exposed, 2,135 feet; width, 25 inches; assay value, 60s. 6d. South Reef: Distance exposed, 1,370 feet; width, 29 inches; assay value, 38s. 3d. The yield from the ore stoped during the quarter continued to be disappointing, and lower than indicated by the ore reserve values of the blocks stoped. This falling-off in grade is mostly confined to the eastern section of the property, and, as referred to by the Chairman at the annual meeting held in June, is apparently due to the fact that the poorer portions of a large number of blocks were being worked. The expenditure on authorised work for capital account amounted to £30,450, leaving an estimated sum of £88,857 to complete the work on hand. The native labour force at the end of the quarter was 13,590, as compared with 11,531 at the end of March, 1911. The interim appropriation account shows a credit balance of £117,815, but this is not wholly available for distribution. The amount of debentures purchased (£32,200) and the capital expenditure (£42,992 on property, development and equipment, £9,989 in respect of annuity for undermining rights) for the six months ended 30th June, 1914, have not yet been appropriated. The amount to be transferred from appropriation account will not be determined until the end of the financial year, and after it has been decided what further dividend is to be declared.

New Modderfontein.

Development at the New Modderfontein in the quarter ended June 30 was as follows:—Main Reef: Distance exposed, 2,669 feet; width, 10 inches; assay value, 204s. 9d. Main Reef Leader: Distance exposed, 26 feet; width, 5 inches; assay value, 354s. 6d. During the quarter under review, the plant has run to its full capacity, milling 154,750 tons, an increase of 23,050 tons as compared with the quarter ending March. The value of the yield was 2s. 5d. per ton milled less than in the previous quarter, which is more in accord with the average value of the ore development. Working costs have shown a satisfactory decrease, concurrently with the larger scale of milling operations. A sufficient quantity of development work has been done, and reef disclosures have on the whole been favourable, both in the upper portion of the mine and in the district developed from the circular shaft. The ore reserve is now be re-estimated and re-valued, and indicates a generally improved position. The new steel headgear at the circular shaft is nearing completion, and structural work on permanent buildings is well in hand. The capital expenditure for the quarter, mainly for development and construction at the circular shaft, totalled £35,890—the balance of working capital on hand is therefore £52,258. The interim appropriation account shows a credit balance of £231,356, which is exclusive of the balance of working capital on hand.

TO CONTRIBUTORS.

The Editor invites Contributions on any subject of interest relating to mining and other industries of South and Central Africa, as also of suitable non-copyright photographs or snapshots of mining or engineering interest. Subject to special arrangement, the scale of remuneration for all articles inserted is at the rate of Two Guineas per page, and 5/- for every photograph. No responsibility can be accepted for safe transmission, but anything that may be submitted that is not accepted will be returned if a stamped and directed envelope is enclosed for the purpose.

AMUSEMENTS.

NEXT WEEK'S PROGRAMME.

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AUTOMOBILE NOTES.

The national importance of the oil-fuel question is emphatically acknowledged by the overwhelming endorsement of Mr. Winston Churchill's resolution in the House of Commons, authorising the issue out of the Consolidated Fund of a sum not exceeding £2,200,000 for the acquisition of share or loan capital of the Persian Oil Company. The resolution was carried by 254 votes to 18, and this practically reflects public opinion on the subject, as voiced in the British Press. It is interesting to note that Mr. Churchill, in his speech, made it quite clear that the Admiralty were fully alive to the importance of continuing scientific experiments with coal, shale and clay, and stated that, if considered useful in stimulating inquiry, substantial prizes would be offered to encourage the development of the economic extraction of liquid fuel from coal.

The question which now occupies the mind of the private motorist is how far this realisation by Parliament of the national importance of the fuel question is likely to affect him privately. Will the action of the Government result in establishing a uniform and reasonable price? Will it stop at the acquisition of its oil interests in Persia, or will it extend the policy now entered upon to other parts of the world? A unique opportunity of acquiring oil possessions within the British Empire appears to be offered in the discovery of the new oil-fields in Canada. To make reasonable provision—in the event of war—against supplies being cut off in one quarter of the world, alternative sources of supply should be secured. That the entry of the Government into the commercial arena should operate favourably in the interests of the private consumer, seems fairly certain if one judges only by the alarm with which the oil magnate views the incursion.

An interesting bit of "Safety First" work has been put in practice by the proprietor of a garage in Louisville, Kentucky. According to the *Electrical Review*, motor vehicles leaving this garage are obliged to cross the sidewalk of a busy street along which pedestrians are passing at all hours of the day and night, and as a warning a lamp has been installed in front of the exit in a large globe, on eash side of which the word "Danger" is painted in large letters. This lamp is lighted from sunset to sunrise, and in itself forms an effective cautionary signal. It is, however, supplemented by a loud-ringing gong, which is automatically operated whenever a vehicle approaches the exit door, a steel plate being so placed that it automatically closes a contact and rings the bell whenever the wheels pass over it. It is said to be interesting to note how pedestrians passing along the sidewalk intuitively "stop, look and listen" at the instant the bell begins to ring, and wait until the car has crossed the sidewalk into the street. It has been suggested that local authorities would do well to enforce the installation of such a device at the entrance to every garage situated on a busy thoroughfare.

The British Electrical and Allied Manufacturers' Association has sent the following circular letter to its members:—"Since the resolutions proposed by the Council on the 4th inst. were circulated to members for consideration, the Government has issued a further proclamation dated September 9th making somewhat clearer the legal position relative to 'Trading with the Enemy,' and an Act of Parliament has been passed in support of it. The proclamation states that in the case of incorporated bodies, enemy character attaches only to those incorporated in an enemy country. Without attempting to define the legal effect of the proclamation or the Act of Parliament, the Council, in view of the foregoing, and of representations made to it, desires to state that the practical difference between companies which largely manufacture here and those which are merely branches whether incorporated in Great Britain or not of concerns domiciled in an enemy country justify the Council in modifying, in favour of the former companies, the proposed resolutions, and thus give effect to the dominant feeling of members that this distinction should govern their patriotic business policy."

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(Incorporated in the Transvaal).

Notice to Shareholders.

NOTICE is hereby given that the Sixteenth Ordinary General Meeting of Shareholders in the above-named Company, will be held in the Board Room, Cullinan Building, Johannesburg, on FRIDAY, the 27th NOVEMBER, 1914, at 11 a.m.

BUSINESS:

1.—To receive the Directors' Report and Financial Statements for the year ended 30th June, 1914.

2.—To elect Directors in the place of the present Board, all of whom retire, but, being eligible, offer themselves for re-election.

3.—To appoint Auditors in the place of Messrs. J. P. O'Reilly and A. Aiken & Carter, and to fix their remuneration for past services.

4.—To transact any other business which may be transacted at an Ordinary General Meeting, or which may be brought under the consideration of the Meeting by the Report of the Directors.

The London Share Transfer Registers of the Company will be closed from the 2nd of the 7th November, 1914, both days inclusive, and the Head Office Transfer Registers of the Company will be closed from the 23rd November to the 11th December, 1914, both days inclusive.

Holders of Share Warrants to Bearer desiring to vote must deposit their Warrants at the Head Office of the Company, Johannesburg, at least 24 hours before such General Meeting, or at the London Office, Salisbury House, London Wall, on or before the 5th November, 1914, together with a statement in writing of the name and address of the Holder of the Warrants, in exchange for which a certificate will be given entitling the Holder to attend and vote at the Meeting in respect of the Shares specified in such Certificate.

By Order of the Board,
H. G. L. PANCHAUD,
Secretary.

Head Office, Johannesburg,
26th August, 1914.

37297

Main Reef West, Limited
(Incorporated in the Transvaal.)

Notice to Shareholders.

NOTICE is hereby given that the Thirteenth Ordinary General Meeting of Shareholders in the above-named Company will be held in the Board Room, Cullinan Building, Johannesburg, on FRIDAY, the 27th NOVEMBER, 1914, at 11.30 a.m.

BUSINESS:

1.—To receive the Directors' Report and Financial Statements for the year ended 30th June, 1914.

2.—To elect Directors in the place of the present Board, all of whom retire, but, being eligible, offer themselves for re-election.

3.—To appoint Auditors in the place of Messrs. H. Hains & J. Fraser and Mackenzie, and to fix their remuneration for past services.

4.—To transact any other business which may be transacted at an Ordinary General Meeting or which may be brought under the consideration of the Meeting by the Report of the Directors.

The London Share Transfers of the Company will be closed from the 2nd to the 7th November, 1914, both days inclusive, and the Head Office Transfer Registers of the Company will be closed from the 23rd November to the 11th December, 1914, both days inclusive.

Holders of Share Warrants to Bearer desiring to vote must deposit their Warrants at the Head Office of the Company, Johannesburg, at least 24 hours before such General Meeting, or at the London Office, Salisbury House, London Wall, on or before the 5th November, 1914, together with a statement in writing of the name and address of the Holder of the Warrants, in exchange for which a certificate will be given entitling the holder to attend and vote at the Meeting in respect of the shares specified in such certificate.

By Order of the Board,
H. G. L. PANCHAUD,
Secretary.

Head Office, Johannesburg.
26th August, 1914.

37298

THE SOUTH AFRICAN
Mining Journal,
WITH WHICH IS INCORPORATED
South African Mines, Commerce and Industries.
ESTABLISHED 1891.

VOL. XXIV., PART I.] OCTOBER 31, 1914. [No. 1205.

HEAD OFFICE: 176-180, Stock Exchange Buildings, Fox Street (2nd Floor), Johannesburg, Union of South Africa.

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Notes and News.

Magadi Soda Disappointment.

To the European war must be attributed a further delay in bringing the property of the Magadi Soda Company to the producing stage, for the directors announce that, owing to the situation in British East Africa brought about by the war, they have had to entirely suspend operations at Lake Magadi, and their resumption does not appear to be very probable in the near future. This announcement is rendered all the more disappointing by the fact that transport arrangements via the Uganda Railway were completed some months ago, and it was then expected that the organisation of the company's business would soon be completed.

* * * *

Gold and the War.

In a footnote to the quarterly reports of all the Albu companies issued this week, it is stated that the revenue from gold shown is based upon the full estimated value of the gold, although as regards the gold deposited with the local banks for account of the Bank of England in August and September only 97 per cent. of the assay value thereof has been received by the company—in terms of the arrangement between the Union Government, the Bank of England and the local Banks. The remaining 3 per cent. of the value of the gold will be adjusted subsequently, after the bullion has been shipped to Europe.

* * * *

Tin Prospects and the Rooiberg Co.

Attention is directed to the review printed in this issue of the prospects of the Rooiberg Tin Co., contained in the speech of the chairman at the annual meeting held this week. In regard to the market for the metal, latest advices are to the effect that the output has hitherto proved less elastic than that of many metals, hence any shrinkage of consumption, unless accompanied by a material falling off in supplies, would for certain be felt sharply. For some time output and consumption have been pretty well balanced, though the drift of events this year until the war was towards an increase in the visible supply. Consumption in Europe must have been pretty severely reduced—indeed, the latest statistics reflect a serious falling off, while it is exceedingly probable that good stocks of the metal are held in the Straits Settlements and in China. A large quantity of tin is known to have been nursed in China for months past, and it can hardly get smaller under conditions of world-wide war. If, as is probable, a trade boom follows the termination of the war, tin should benefit correspondingly with other metals, if only because of the inelastic conditions affecting production. In a general way, when mining properties are abandoned owing to bad times, it takes a long period for them to be set going again when things improve; and this is especially so when, as in the case with tin mines, they are in many cases relatively small concerns, situated in scattered and isolated districts and worked more or less haphazard and on limited capital. Hence, while the process of curtailment of output at mines has been rather rapid, that of enlargement is bound to be a much slower affair, and immediate prospects point to a decrease in the supplies available.

* * * *

Clearing House for Enemies' Debts.

The suggestion of the British Manufacturers' Agents' Association that a Clearing House be formed for the purpose of collecting moneys due to traders in Germany and Austria, and paying from the sums collected debts due by Germans and Austrians in Great Britain and Ireland, has been taken up by many other commercial associations, in addition to which the Manufacturers' Agents' Association has received numerous letters of support from individual traders and from representatives of commercial houses in France and Holland. In a circular issued by the Manufacturers' Agents' Association it is stated:—"Although the method is drastic and would involve a great amount of labour, it is generally considered to be more sound than the suggestions made to the effect that bankers should make an advance on account of the debts under guarantee from the Government, and that at the end of the war the German Government should be made responsible for the collection and repayment of the debts. This method may sound the simpler, but it should be remembered that the German Government may have to undertake other obligations which will not be settled in a day; and, again, suppose the German Government does not see its way to carry out the guarantee for many years, are our creditors to pay interest to the banks on these advances? Yet, again, is there going to be a German Government after the war?"

* * * *

Enemy Patents.

It is officially announced that "all persons resident, carrying on business or being in Our Dominions" may pay any fees necessary for obtaining the grant, or for obtaining the renewal of patents, or for obtaining the registration of designs or Trade Marks, or the renewal of such registration *in an enemy country:* and also may pay into the British Patent Office in London on behalf of an "enemy" any fees payable on application for, or renewal of, the grant of a British patent, or on application for the Registration of British Designs or Trade Marks, or the renewal of such registration. The German, Austrian and Hungarian Patent Offices have issued various temporary rules and indulgences to safeguard certain rights of applicants and patentees which might otherwise have been jeopardised or lost by reason of delays arising out of the hostilities. Switzerland, though not a belligerent, has likewise provided for special extensions of time for payments and for other matters. The United States Patent Office, whilst it has no authority to extend the time of filing applications delayed "because of the unsettled condition of European affairs," will probably present the matter to Congress with a view to the obtainment of legislation to remedy the disabilities arising out of such delays.

* * * *

New Issues in September.

The offerings of capital in London in September, like those in August, have been distinctly of a war time character, but in spite of the business depression the company promoter and the financial agent have not been entirely inactive.

Description	September, 1914.		August, 1914.	
	No. of New Loans.	Share or Deb. Cap. or Amount of Loans.	No. of New Loans.	Share or Deb. Cap. or Amount of Loans.
Public loan	10	£10,041,200	7	£81,300
Financial	1	43,900	1	38,000
Commercial and Miscellaneous	2	201,500	1	50,000
Issues by existing companies	15	722,100	11	1,407,400
Mining	1	2,000	2	59,800
Total	29	11,010,700	22	£1,636,500
Bill issues	5	20,600,000	4	£31,900,000
Grand total	34	£31,610,700	26	£33,536,500

In September last year the total, excluding bill issues, was £13,191,200. If we omit the £10,000,000 of New York securities the figure for the past month shrinks to very small dimensions, and one has to go back for a decade or more to find the volume of capital offerings as restricted as it has been for the last four weeks.

Calumet and Hecla Ventilation and Temperatures.

The temperature in the deeper workings of the conglomerates of the Calumet and Hecla of the Tamarack is higher than in any of the other mines (states the *Engineering and Mining Journal* of New York). The temperature varies with the depth and with the season, but the temperature of the amygdaloid mines is universally low. The average temperature of the air in the bottom part of the Calumet and Hecla conglomerate is about 80 deg. The highest temperature ever found in that formation was in the rock and was 87 deg. Rock temperature was obtained by drilling a long hole in the wall and putting in a low-registering thermometer, sealing the hole and leaving the instrument for a period of weeks or months. The temperature of the amygdaloids will vary from 55 deg. to 70 deg., being higher in the lower levels of the Tamarack than at any other mine in the district. A long series of tests of air temperature at the Tamarack gave a maximum of 89 deg. in October, 1909, on the 39th level. The average air temperature in the bottom level is from 82 deg. to 84 deg. The mines all have natural ventilation, which is so effective as to require control in winter, doors being placed over the shaft to retard the descending current of cold air. There is no artificial ventilation other than the compressed air used in drilling. Mr. MacNaughton gave as his opinion that no advantage could be had by artificial ventilation, since the only real difficulty encountered was that of gas clinging in moist muck after blasting, for which fan ventilation would of course be no remedy.

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The Call of Publicity.

Our contemporary, the *Mining Magazine*, whose cartoons and circulars are doing much to inspire a spirit of pluck and confidence in its readers, has just issued another appropriate pamphlet, which we have pleasure in reproducing:—"WAR THE OPPORTUNITY FOR BRITISH FOREIGN TRADE.—To-day the firms sincerely believing in the efficacy of advertising are plainly discoverable. They are practising their beliefs. Those of little faith have withdrawn to the limbo of obscurity. At the first sign of trouble they retrenched on expenses they considered unnecessary. Their shutters are up. Their names and products which were flaunted invitingly to the wide world have been withdrawn to the narrow confines of their doorways and factories within limited frontages on narrow streets. The syren call of publicity has hushed for them, and as with the expired note of the whistling indiarubber pig, they lie inert and flat. Throttle publicity and slowly but surely the wheels of enterprise and commerce cease to revolve. Quit the call of trade and the stillness is the death of optimism and energy. 'Men work best who sing as they work.' Firms succeed best who cheerfully shout the excellence of their wares through the medium of the public press. Have you faith in yourself—confidence in your product and the energy to win? Do you take joy in surmounting greater obstacles to reach a greater goal? The world still staggers beneath the blow of war. It is true money, the prince of cowards, took to cover at the first rumour of conflict, but it can be coaxed out into the open yet. Optimism, courage, conviction and energy is needed, and the time is now. The dignified reticence of perfect quiet, the eminently decorous demeanour of absolute stillness is not going to bring you business. The pessimists who have ceased to advertise have spread the straw before their doorway and put up the 'don't hoot' sign; convincing evidence their business is extremely ill. Make a noise like business and you'll get it. Advertising pipes the tune that will charm the buyer from his burrow."

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Sakalava Oil.

The Secretary writes: "We shall esteem it a favour if you can find space for the following cables recently received from Mr. S. A. R. Skertchly, M.Inst.M., M.M.I.M.E., our Engineer and Manager: Received 10th September, 1914: Number two well now 712 feet deep, in impervious calcareous sandstone. At 666 feet struck good show of light gravity pale brown oil which continues at present depth. Is probably oil filtered through from deeper petroliferous stratum. This important feature gives great promise to the field. Received 29th September, 1914: Will commence drilling number three well with large machine in about fifteen days. Have stopped number two well 776 feet pending arrival of tools. Received 13th October, 1914: Have started number three well. Received 26th October, 1914: Number three well drilled 225 feet, show of oil at 55 feet, another at 185 feet. From correspondence received it appears that at 776 feet light gravity oil was still encountered, and well will be deepened on arrival of the tools required. Number three well is being drilled with the 3,000 foot machine on a site selected by Mr. Skertchly about a mile N.W. of number two well on the Marobaolo Anticline.

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Mining Regulations.

At the Criminal Sessions, this week, a miner named Albert Hodgson was charged with a contravention of the Mining Regulations, the allegation being that he drilled into a misfired hole, causing an explosion by which a native was killed. Dr. Krause, K.C. (with him Mr. Morris), appeared for the accused. The evidence was given by native witnesses, and was of such a contradictory nature that Mr. Welsh, on behalf of the Crown, stated he would not proceed, as he could not prove accused's knowledge of the misfire. The jury accordingly, on the direction of Justice Sir Johannes Wessels, returned a verdict of not guilty. Addressing Mr. Milne, Deputy Commissioner of Mines, Boksburg area, who watched the case on behalf of the Mines Department, His Lordship said: I wish you would get the Government to alter these rules, or otherwise not waste the money of the State in prosecutions under them. Do impress on the Government the necessity of having a different court to decide these cases. You want a Magistrate who knows them, and who can go down into the mine immediately after the accident has happened and get the evidence there. Let the witnesses point out then and there, on the face of the workings, what has taken place. You cannot ask a Judge three or four months afterwards, on evidence such as we have heard, to convict a man. Dr. Krause remarked that a recommendation in similar terms was made by the Mining Regulations Commission, of which he was chairman, years ago. His Lordship: I have done *it* myself too. I have done it repeatedly. It is a hopeless task. I cannot get them to see the necessity of it. Accused was discharged.

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Progress on Albu Mines.

Satisfactory progress was made on the Albu mines in the quarter ended September 30. At the Aurora West the working profit shows an increase of £7,746 12s. 9d. over that for the previous quarter: it must be remembered, however, that milling operations for the last-mentioned period were adversely affected by the accident to the headgear in April. At the Roodepoort U.M.R. the working profit shows a decrease of £462 6s. 3d. as compared with the previous quarter. On the other hand it will be seen that working costs were charged with £1,391 13s. 1d. for mine development redemption in excess of actual expenditure on mine development, and also include the expenditure on the reopening and equipment of No. 2 and No. 3 shafts in the United Section of the property. At the Meyer and Charlton the working profit is £3,642 11s. 4d. less than that for the preceding quarter. The main incline shaft has been sunk 93 feet and is now 274 feet below the 21st level. The mill pulp launder between the mill and cyanide works is being entirely reconstructed. This work will probably be completed in October. At the Van Ryn the working profit shows a small decrease of £343 19s. 1d. as compared with that for the previous quarter. A satisfactory feature of the operations for the period under review is the decrease of working costs, which reflect a reduction of 1s. 4·25d. per ton. Owing to a shortage of native labour, the footage developed was considerably less than that accomplished during the previous quarter. There is, however, every indication of an improvement in the native labour position shortly. At the New Goch the working profit shows an increase of £1,770 9s. 3d. over that for the previous quarter.

TOPICS OF THE WEEK.

THE WAR AND SOUTH AFRICA.

WITH the outbreak of rebellion among a section of our people in South Africa, the war takes on a new phase. Hitherto the attitude of this country has been not very dissimilar from that of the other British Dominions. Our interest and our energies have been confined to the despatch of reservists overseas to the aid of the Mother Country, the capture or embarrassment of German colonies in our immediate vicinity, and the offer of subscriptions in money and kind to the fighting forces of the Empire. But there the analogy ends. South African problems and conditions are in certain respects different from those of the other Dominions, and somewhere about now we part company from those Dominions in our attitude towards this crisis. England's difficulty is Africa's opportunity in the eyes of some of our erstwhile friends from the Backveldt, and we are to-day faced with the overt hostility of a portion of the people of the country districts, who are led to believe that the British Empire is in dire straits and tottering to its doom. Of course, their intelligence equally with their honour is at fault, and, unfortunately, there is every reason to believe that they are the victims of a world wide conspiracy, founded on lying and intrigue, to subvert British supremacy and to advance the German hegemony, regardless of the cost. Fortunately for South Africa, at this time of national stress and peril, she has at the helm men of such outstanding patriotism, ability, and commonsense as Generals Botha and Smuts. The combination of qualities is almost unique in statesmen of new, young countries, and is as necessary as it is uncommon. The splendid front shown by General Botha, his wisdom in taking the offensive, and his heroic self-sacrifice in setting the salvation of the country above personal ease and safety are not to be measured by the layman. Such things go to the making and embellishment of history. In appraising the work of General Smuts, however, we are on more familiar ground. He is responsible for the organization of the Defence Department, and of that other branch of defence which is finance. His handling of the latter, at least, we are competent to measure and extol, and it must be said at once that he has done excellently in the face of unprecedented difficulties. One example of his success must here suffice. Some trouble occurred on the railway. True to its conservative traditions the S.A.R. Administration thereupon announced that goods would only be carried at owner's or consignee's risk. The Johannesburg Chamber of Commerce pointed out that the net effect of this would inevitably be to send up the price of goods to merchants, to retailers and to the general public. The Department which General Smuts controls, with the able assistance of Mr. J. R. Leask, at once announced that it would take over from the railway all liability in respect of goods damaged, captured or destroyed by the rebels, and commerce at once reverted to its even way, prices remaining unaltered. The incident shows as nothing else can how big and broad the view of the men responsible for the public finance of the Union. If Mr. Lloyd George, as Chancellor of the Exchequer, was not above learning from the merchants of the City of London how to conduct affairs in a world crisis, neither are our South African statesmen. Despite all doubts, therefore, we can look forward to the early, successful settlement of this new trouble by the Union Government.

MONEY AND THE SHAREMARKET OUTLOOK.

THOUGH the effect of the week's news on the Johannesburg share market has been to defer still further the hopes of an early reopening, advices from London are very cheerful. The monetary position there is being steadily strengthened, and the damage deliberately wrought by German machinations is being repaired. The negotiations which for some time have been going on between the banking sub-committee and the London Stock Exchange Committee, with a view to the adoption of some scheme that would render it safe to reopen the Stock Exchange, have been satisfactorily concluded, and now await only the approval of the Government. The substance of the arrangement is that members of the Stock Exchange who, because of the war, find themselves unable to meet their obligations, are to be given grace during the continuance of hostilities, and for twelve months afterwards; that the prices of all Stock Exchange securities, as made up at the last settlement in July, are to be taken as representing the present value; and that against the securities lodged with bankers and other lenders to the Stock Exchange a moderate percentage is to be advanced by the Bank of England, the Bank of England being guaranteed by the Government; that the percentage so advanced is to be given direct to the members of the Stock Exchange, who are thus to receive capital sufficient to restart their businesses; that the securities upon which the loans were originally made by the banks and other lenders are to be earmarked as security for the Bank of England; and that thus practically no loss need be feared. As the quotations at the end of July were very low it is incredible that there can be any serious loss, when the Bank of England advances only about 25 per cent. of the value as represented by the making-up prices at the end of July. In addition to this, the guarantee of the Government makes the Bank of England absolutely safe. The Government, for its part, is secure against loss, since the guarantee is for so small a proportion of the total indebtedness. Altogether the arrangement seems acceptable, and doubtless no time will be lost in carrying it into effect. It is manifestly indispensable that the Stock Exchange shall be opened as soon as possible, for, of course, a National Loan is out of the question as long as the Stock Exchange is closed. Furthermore, it is of the highest importance that every person who has invested in Stock Exchange securities of any kind shall be able to borrow upon such, or, if necessary, to sell them. It need hardly be pointed out that as long as a man cannot make use of his securities either to pay his debts, or to enter into new enterprise, business cannot be carried on as actively and as successfully as it ought to be. In this connection it is of interest on this side to note that notices were issued on October 2 by the London Stock Exchange Committee, fixing the deferred settlements for November 18, and referring to alterations of old and of promulgation of new rules. Apparently the Committee contemplates a departure from the hitherto iron-bound rules as regards defaults of members of the Stock Exchange, inasmuch as provision is now made for what may, for want of a better term, be described as "provisional defaults." That is to say that in the event of any member being unable to fulfil his engagements the position shall be dealt with by a committee appointed for the purpose, and instead of the member being publicly announced as a defaulter, the case is to be dealt with on its merits. If his case is one of *bona-fide* misfortune, and indicates ability later on to complete engagements, he is suspended from entry into the Stock Exchange and from dealing until his position is settled, but he will not be publicly declared. If, however, after investigation the Committee thinks right to allow matters to take their course, he will, as usual hitherto, be publicly declared a defaulter. There are various other details, as, for instance, how the Official Assignee shall settle the estate of the new form of defaulter with the co-operation of a committee of the creditors, instead of, as heretofore, the position being summarily dealt with by the Official Assignee alone. The Johannesburg Stock Exchange will doubtless take over from these provisions what is best and most applicable to local circumstances.

CYANIDE SUPPLY.

OWING to the enterprise of British cyanide manufacturers, the supply of that essential of Rand gold production has now been placed on a satisfactory footing. In the United States the problem has been almost as pressing as on the Rand, and at one time consumers in the States attempted to divert some of the Rand's supply to their own needs. There seems to be a good deal of uncertainty about the manufacture of cyanide, but there is no uncertainty about the proposition that if the gold mines do not get it, a large number of men will be thrown out of employment and the supply of precious metals will be materially reduced. As to why it is not more largely manufactured, there is a difference of opinion. Independent chemists maintain that it can be manufactured cheaply almost anywhere, but that the present output is in the hands of German monopoly, which has effectually throttled all attempted competition. The producers deny this, and state that they are producing it as cheaply as possible, and that the lack of competition is purely through economic reasons. Be that as it may, the fact remains that the most of the cyanide used in precious-metal recovery is made in Germany, and the supply at the beginning of the war was decidedly short both in America and here. In the States, one factory only is in operation, that of the Roessler and Hasslacher Chemical Co., important producers, at Perth Amboy, N.J. Its owners say that they are prepared to supply all contract holders with their necessities; also that regular customers will probably be supplied up to their normal requirements, but that no increase of consumption can be provided for and no new demands met. Many cyanide users in America, foreseeing a shortage, have made efforts to secure advance supplies sufficient to secure them from idleness. The producers have refused to comply with these requests, and this fact has done more than any one thing to give a greater impression of stringency than that which really exists. Apart from the German cyanide factories, there is a good production in England, but that will be of little use in America, since it is likely to be claimed for South African use. The Rand properties are of such great value in the present circumstances, that it is certain that every effort will be made to keep them at work. According to New York contemporaries the fact that cyanide is not made more largely in the United States is not through lack of knowledge or material, but on account of either or both of the conditions already mentioned. Now that the necessity is so great, several movements are on foot to institute its manufacture on a commercial scale. One such movement was instituted four or five years ago in Mexico, where a French syndicate had perfected plans to manufacture sodium cyanide in Mexico City. Civil war in that country prevented the materialization of the project at that time, and it is not known whether it has been since considered. As we pointed out last week, the American Cyanimid Co. has been considering cyanide production for some time, and has, in fact, ordered the necessary machinery to make it, with the idea of marketing cyanide not later than January, 1915. Since the machinery was ordered in Germany, there is a strong factor of doubt about the time manufacturing means will be completed, unless the machinery had left Europe previous to the outbreak of war. In any event, new American cyanide seems a practical certainty some day. In addition to those mentioned, there are two other movements in the States to produce cyanide for the mining industry. Neither of these, however, has progressed to the point of giving definite information as to when production will be started or how much will be offered. Late advices point to a notable increase on the part of the English factories, so that those who contemplate production in America are hesitating, keeping a careful eye on those movements.

TRADE QUESTIONS AND THE WAR.

Some Important Business Problems—Union Government and Relations with Foreign Countries—Cargo in Enemy Ships—The Moratorium—Clearance of Debts—Cable Charges.

The trade in electrical plant and appliances is one in which Germany was a formidable competitor, but according to information just come to hand, *via* Switzerland, it is shown that, at the end of last month, the Allgemaine Elektricitats Gesellschaft found it practically impossible to make any deliveries, export was quite interrupted, and the electrical department was working on very short time. Existing prices were withdrawn, and in many cases were increased by 10 and 20 per cent. Other German firms have been similarly affected. The question of who should pay the war risk premium on old contracts for delivery of goods abroad is a more thorny one than might have been supposed. It has been considered by the Emergency Committee of the Manchester Chamber of Commerce, who take the view that each contract should be considered on its merits.

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At the meeting of the Mawchi Tin and Wolfram Company in London recently, Mr. Steinhardt (a member of the firm of consulting engineers to the company) discussed the outlook for the sale of the production of wolfram, the market for which has heretofore been substantially confined to Germany. He explained that, though some years ago a factory for the extraction of tungsten—the metal contained in wolframite—had existed in England, all the tungsten metal used in the manufacture of the so-called self-hardening tool steel, made by the steel makers of Sheffield, now came from Germany. He had been associated with the wolfram industry, both as a miner and as a metallurgist, for some twelve or fifteen years, and he, with his friends, had been approached by the Sheffield steelmakers with a view to the re-establishment of tungsten extraction in England. He was happy to say that a factory would very shortly be completed. The Government had also taken certain steps, which he was not at liberty to disclose.

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In connection with the scheme which the Board of Trade have initiated for assisting British manufacturers and traders to take advantage of the opportunity afforded by the war for securing trade formerly in the hands of German and Austrian or Hungarian rivals, it is notified that information in regard to commercial and financial conditions and openings for British trade in the above-mentioned countries has been received at the Commercial Intelligence Branch of the Board of Trade, 73, Basinghall Street, London, E.C., where the detailed reports may be inspected by United Kingdom manufacturers and traders.

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UNION GOVERNMENT AND ENEMY TRADE.

The Secretary of the Johannesburg Chamber of Commerce writes: —The attached letters have been received from the Treasury. My Committee would appeal for the co-operation of all traders in assisting the Government by reporting any instances which come under their notice of attempts to contravene or evade the conditions of His Majesty's Proclamation and of any obligations imposed on traders thereunder.

The Treasury,
Pretoria, October 24, 1914.

Sir,—I have the honour to refer to previous correspondence with your Chamber on the subject of trading in the Union by German and Austrian subjects. Facts have come to my notice which indicate that the requirements of the Government with regard to goods held by firms in the Union from German and Austrian firms for sale on consignments namely, that such goods shall not be sold except under the condition that the proceeds of sale shall be deposited with the Treasury for custody during the period of hostilities—have not been generally observed. Steps are being taken to secure strict compliance with this requirement, and any firms who, through ignornace thereof or for other reasons, are now in default, are warned that they should at once account to the Treasury for the proceeds of any sales of such goods made since the outbreak of hostilities. It has come to my notice that attampts have been made to remit money or the equivalent thereto to enemy subjects through neutral countries. Such proceedings are in direct conflict with His Majesty's Proclamations, and the severest measures will be taken against anyone attempting to effect any transaction of this nature. I should be glad if you would bring these points to the notice of your members, in order that they may communicate to the Treasury any cases in which they may have reason to believe that Proclamation is being violated. I would also ask you, in your capacity as joint secretary to the Association of Chambers of Commerce of South Africa, to circulate this letter to the Chambers of Commerce affiliated to that Association.

I have the honour, etc.,
(Signed) JAMES R. LEISK,
Secretary for Finance.

The Secretary,
Johannesburg Chamber of Commerce,
P.O. Box 687, Johannesburg.

The Treasury,
Pretoria, October 22, 1914.

Sir,—I beg to inform you that the attention of the Treasury has been directed to a trade letter issued by Messrs. Post van der Burg and Company, of Rotterdam, inviting orders for German goods. For your information, I enclose an extract from a leading article which appeared in the "Cape Times" of the 17th inst., and would observe that, as indicated therein, the letter in question is an invitation to indirect trading with the enemy. The matter has been brought to the notice of the Chief Censor with a view to the discovery of any breach of His Majesty's "Trading with the Enemy" Proclamations, and my object in addressing you is to suggest that the views of this Department might be intimated to the members of your Association, and also to inquire whether you have any suggestions you would like to offer for effectively dealing with the situation. A copy of this letter is being transmitted to your colleague in Capetown for his information.—I am, Sir, your obedient servant,

(Signed) JAMES R. LEISK.
Secretary for Finance.

The Joint Secretary,
Association of Chambers of Commerce,
P.O. Box 687, Johannesburg.

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In response to numerous enquiries with regard to the procedure to be adopted by the owners of British cargo in enemy ships in neutral ports in order to safeguard their interests, the British Board of Trade, on the recommendation of the Committee on Diverted Cargoes, offer the following suggestions and observations:—

1. The Foreign Office have issued instructions to British Consuls to give all possible assistance to British owners of cargo in enemy ships.
2. In the case of the sale or attempted sale of the cargo by the master of the ship, it may be open to the owner of the cargo to obtain redress by legal proceedings in the local courts, and the owner of the cargo, if he desires to take such proceedings, should, whenever practicable, instruct local agents to take the necessary steps.
3. If, in lieu of such action, the owner of the cargo desires to arrange for the delivery of the cargo itself, or of the proceeds, if the cargo has been sold, he should give a power of attorney to a local agent with authority to arrange for the transhipment or storage of the cargo, or to receive the proceeds. This transaction would probably involve the payment to the master of the ship of the freight and other charges.

The Board of Trade, in pursuance of their powers under paragraph 8 of the Trading with the Enemy Proclamation No. 2, dated September 9, 1914, have decided that payments may be made by British subjects to the agents of enemy shipowners for the purpose of obtaining possession of their cargoes in neutral ports. The Board of Trade have given a general licence permitting all persons resident, or carrying on business, or being in the British Dominions, to pay any fees necessary for obtaining the grant, or for obtaining the renewal of patents, or for obtaining the registration of designs or trade marks, or the renewal of such registration in an "enemy country." And also to pay on behalf of any "enemy" any fees payable on application for or renewal of the grant of a British patent or an application for the registration of British designs or trade marks or the renewal of such registration.

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Traders generally are protesting against the high cost of cabling. On the outbreak of war the Imperial Government

Censor prohibited the use of codes in cabling, and also the use of registered addresses. These restrictions have now been withdrawn, with certain qualifications. Complaints are made that the cable companies have made capital out of the situation. "Deferred" messages which were in operation for plain language cables at half rates were in most instances promptly suspended. Plain language cables, with the full name and address of the addressed and addressee, being compulsory by the Government, were charged by the cable companies at the full rate. A concession has been made by some companies by which ten plain words are charged as one, but this does not meet the difficulties of firms dealing in goods of a widely varying technical nature, for which code words are specially prepared.

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An important statement was made recently by Sir Algernon Firth at a meeting of the Halifax Chamber of Commerce. He said the Government had concluded it was not wise to attempt to collect debts due to Germany and Austria. They decided it was better to leave the money owing to Germany and Austria in the hands of the people in this country who had it, and let them use it in the meantime, while the Government confined their attention to making advances on money due from Germany and Austria. He had been in almost daily communication with Government officials on this subject for several weeks. The Government were fully alive to the importance of this, and they knew it was absolutely necessary it should be done before the moratorium came to an end on November 4th. In regard to the debts owing to and from the allied belligerent countries, Sir Algernon said he thought it quite possible to make arrangements for a clearing house of debts. The British Government should collect what was owing by their nationals, and should be prepared to pay out of the amount collected what was due to their nationals. Also the Government should stand behind the collection of these debts at the end of the war. But if our Government saw fit to class all foreign debts together, and offer traders advances against the whole of them, he did not see that anybody should object.

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A special supplement to the *London Gazette*, issued recently, contained the Proclamation varying the Proclamations in respect of the postponement of payments, dated August 2, 6, 12 and September 3. Payments other than bills of exchange not being cheques or bills on demand which fall within the general Proclamations and become due and payable after October 3 and before November 4 will receive one month's extension or one month's further extension, as the case may be. Payments falling due after November 3 will not receive any extension. Bills of exchange (other than cheques or bills on demand) accepted before August 4, of which the original due date is after October 3, will continue to receive one month's extension under the Bills (Re-acceptance) Proclamation of August 2. Bills which have already received an extension under previous Proclamations or receive an extension before October 4 will be given a further extension of fourteen days. It is stated that it was originally intended not to prolong the bill moratorium beyond October 4, but, in view of the shortness of the time which this would have allowed for setting up the machinery for dealing with the pre-moratorium bills, a further fourteen days' extension is given.

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At the last monthly meeting of the Employers' Parliamentary Association, which was held in Manchester, the president, Sir Charles W. Macara, Bart., in the chair, moved the adoption of the following resolution, which was carried unanimously:—"That the various interests—industrial, commercial, financial, transport, and labour—ought to co-operate with the Government in order to keep British industries going as far as it is possible to do." It was also decided to assist members of the association under existing circumstances by the establishment of a temporary enquiry bureau, whereby members buying and selling goods could be placed in connection to their mutual advantage; arrangements in this connection were to be made whereby the scheme should be worked in co-operation with the one recently instituted by the Board of Trade. As regards trade relationships with enemy countries, the following resolution was unanimously adopted:—"That this committee strongly supports the opinion of the Association of Chambers of Commerce that the Government be urged to enter into negotiations with the Committee of Bankers with a view to the assets of manufacturers and merchants in the way of foreign book debts and stock being guaranteed against loss jointly by the Government and the banks." The questions of the advisability of the adoption of the Continental system of sending acceptances with invoices and of the existing arrangements with respect to war risks insurance were discussed. It was agreed that any alterations under either of these two heads were, at the present time, inadvisable.

THE POSITION OF THE EAST RAND MINING ESTATES.

Grootvlei Still Awaiting Capital—Unsuccessful Prospecting on the Modderfontein Proprietary Ground.

The report of the East Rand Mining Estates, Ltd., for the year ended 30th June, 1914, presented at the meeting on the 7th instant, states that the landed interests of the company remain as last reported, namely, a total of 21,146 acres. A scheme for the sub-division of the farms into smaller blocks, suitable for leasing to white tenants, has been formulated during the past year, the object being to gradually replace the native tenants by a good class of white settler who will take a long lease and pay a cash rental instead of a share of crops. This scheme has been applied to the farm Vlakfontein, which has been divided into six blocks, varying from 500 morgen to 700 morgen in extent. Four of these blocks have already been leased to first-class tenants at satisfactory rentals. Although the adoption of this scheme entails a certain amount of capital expenditure in providing material for houses and boundary fences, sinking additional wells, etc., the company will retain the benefit of these improvements, which will considerably increase the rental value of the land. The directors intend to extend, as far as possible, this settlement policy to the other land holdings with a view to securing a permanent body of intelligent and progressive tenant farmers on the estates, thereby ensuring a steady improvement in the agricultural value of the land and increased rental returns. Owing to the unprecedented droughts and the early frosts, the past season has been a bad one for farmers, the grain being poor in quality and realising very low prices. This has considerably affected the revenue from this source, the net amount realised by the farming operations being £1,342, as compared with £2,842 the previous year. The directors have been unable to make any arrangement for the provision of the further working capital required to develop and equip the Grootvlei mine, but feel no doubt that with improved financial conditions they will have little difficulty in obtaining the additional funds required for the development of the Grootvlei property. The prospecting operations carried out by the Modderfontein Proprietary Mines on their property having been unsuccessful, the farms belonging to that company have now been realised and the company has been placed in liquidation. The return to be made to the shareholders will, it is estimated, entail a loss of about £30,000 to the company in respect of its shareholding. The directors have decided to write off this amount to profit and loss, but to appropriate £22,500 standing to the credit of share premium account in reduction of this loss. The balance to be written off in respect of this loss will therefore be £7.500. The expenditure during the past year amounted to £1.716, the revenue being £3,878, showing a surplus of £2,162. The £7,500 written off as above has resulted in a net loss of £5,338, this amount having been transferred to the balance sheet.

THE GERMAN MACHINERY MARKET IN SOUTH AFRICA.*

Points About Pumps and Internal Combustion Engines—Some Informative Statistics —Efficient Local Representation Advised—Power Plants for Mining Purposes.

THE following statement shows for a recent year the value of the undermentioned descriptions of pumps and pumping machinery exported from Germany, Austria-Hungary, and the United Kingdom to the principal colonial and neutral markets. In the case of Germany and Austria-Hungary their exports to the United Kingdom are also stated.

	Germany,	Austria-Hungary,	United Kingdom,
	1912.	1913.	1913.
Country to which Exported.	Pumps, Water-pumping Machines.	Pumps.	Pumping Machinery and parts thereof.
United Kingdom	£18,450	£190	—
British South Africa ...	5,700	—	£26,600
Norway	3,700	490	1,400
France	52,300	190	28,000
Spain	15,900	180	18,400
Italy	34,050	720	20,200
Bulgaria	800	570	—
Roumania	14,600	2,470	—
Russia—Northern ports	91,850	1,030	46,500
Southern ...			16,300
Turkey	7,900	100	7,800
Egypt	6,750	—	33,300
Dutch East Indies ...	10,300	290	4,300
Japan	9,550	—	79,500
Brazil	12,650	—	9,500
Argentina	29,300	180	64,400
Chile	8,850	—	13,000
Cuba	4,650	—	400
Mexico	9,950	—	7,100
Total to above markets...	£337,250	£6,410	£376,700
Total to all markets ...	£533,900	£15,740	£677,800

The above particulars, so far as they refer to German are exclusive of those for pumps in combination with steam and gas turbines or in combination with combustion and explosion motors. These articles are dealt with separately. The following particulars are available as to the special requirements of the South African market:—In South Africa, Germany still has a by no means inconsiderable share of the total trade, although her imports in 1913 failed to reach the level of 1911. According to a special report drawn up by H.M. Trade Commissioner in 1909, dealing with the position of British machinery, etc., in the mines of the Transvaal, there is a steady increase in the demand for high-lift pumps for underground use. Multi-stage centrifugal pumps have been adopted by a number of mines, and Continental makers have secured almost all the orders placed by mines of this type. For surface work centrifugal pumps (of non-multi-stage type) practically monopolise the market, and are at present mostly of British manufacture. Competition in centrifugal pumps generally is severe. Reciprocating pumps, for underground work, are about equally divided between America and Great Britain, though a few orders go to the Continent. Steam pumps of British manufacture are very much in the background. The percentages for the period 1904 to 1908 were as follows:—

	British.	American.	Continental.
	%	%	%
Steam	33	63	4
Centrifugal ...	43	54	3

There is little evidence of Continental competition in pumps, but it is noticeable that many of the motors used for driving three-throw pumps are of Continental make. Electrically-driven pumps are very much in favour. In boiler-feed pumps the preference is most decidedly in favour of well-known British makers. The future demand will be for electrically-driven three-throw pumps capable of working economically against considerable heads and arranged for stage pumping. There is a large field in the near future for makers of this class of pumps. Centrifugal pumps are chiefly in use for work in slimes plants, extractor houses, cyanide plants, and as solution pumps. A decided preference is shown for American pumps for this class of duty, but the majority of renewals to these pumps—new blades, liners, etc.—are made locally. The remarks made under the heading steam pumps apply equally to centrifugal pumps. High-lift centrifugal pumps have been tried for mine pumping with satisfactory results, and it is probable that universal electrical power supply will open up a field for these pumps. Greater efficiencies are sought from these pumps, surpassing the best Continental practice of to-day. Given these, the demand should be very large indeed.

Internal Combustion and Explosion Motors, Gas Turbines, etc.—The following statement shows for a recent year the value of certain descriptions of internal combustion and explosion motors, gas motors, etc., exported from Germany to all destinations in 1912:—Stationary combustion and explosion motors; blast furnace-gas motors, £1,472,000; steam and gas turbines in combination with dynamos, pumps, hammers, blowing machines, freezing machines, hoisting machines, £617,000; combustion and explosion motors, blast furnace-gas motors in combination with dynamos, pumps, hammers, blowing machines, freezing machines, hoisting machines, £81,000; individual parts for steam engines, steam and gas turbines, water power engines, steam and gas turbines, water power engines, stationary combustion and explosion motors, blast furnace-gas motors, hot air and compressed air motors, cranes, etc., £656,000; total, of above, £2,826,000.

H.M. Trade Commissioner for South Africa, in a special report issued last year, stated that the present position in South Africa of British-made oil engines was by no means unsatisfactory, although it is capable of improvement. In engines of over 5-horse power capacity the United Kingdom practically controls the market, but in the smaller sizes American makers are in a commanding position, although British firms are making their influence felt in their endeavours to compete. Germany does very little trade in this line. Efficient local representation is a matter of vital importance in building up a regular business in the country. Where power is required in Rhodesia for mining, industrial or municipal purposes, steam or electricity is employed in preference to oil or gas, except in a few isolated instances. For mining purposes there may be said to be no opening for oil engines, since few are in use or are likely to be installed. Electricity and steam are so readily available at the mining centres that their use in preference to that of oil or gas plants is easily understood. The efforts of British makers should be directed chiefly towards the improvement of the smaller sizes of engine, in which America has specialised, since the larger machines of British make are regarded as being in every way satisfactory and are subject to but little serious foreign competition. There is a fine opening for a satisfactory air-cooled engine in this market, as being an improvement on those merely water-cooled. Then, an essential requirement is the "walking beam," as embodied in the "Jack-of-all-trades" engine of American make. The beam (or rather the gearing which works the beam) should be capable of easy disconnection from the engine, so that the engine may run free and its flywheel be used for belt-drive to centrifugal pumps, mealie-crushers, or other machines required for farm purposes. Lastly, the importance of simplicity in construction cannot be too strongly emphasised. Spare parts should be interchangeable to the greatest possible extent, with the dual object of reducing the prime cost of manufacture and of obviating the necessity for merchants or farmers stocking a large variety of sizes of any one spare part. Farmers are in engineering matters non-technical, and the replacement of broken parts of an engine should, through this simplicity of construction, be made as easy an operation as possible. It would be a considerable advantage if the directions as to working, cleaning, etc., were printed on enamelled plates, as paper instructions are speedily lost or destroyed. In the future, should crude oil be obtainable locally and the supply be sufficient in quantity and regularity, it might be advisable for makers to turn their attention to an engine working on crude oil. For the present, however, the demand for such a type does not warrant attention. British prices are high as compared with American, and whilst it is true that the British engines contain "better value for the money" than do those of their competitors, every effort should be made to bring the cost of engines to farmers and others down to the point at which they appear reasonable from the very first. Many orders in the past have gone to America for reasons of price alone, but the desirability of farmers being educated at the outset to the use of power through the medium of British-made machinery is obvious. Something has undoubtedly been lost to home manufacturers owing to the initial work of education having been commenced by American makers and their agents in this market. A list of the leading South African merchant firms who are trading in gas and oil engines, or of firms who are open to consider the representation of United Kingdom firms, may be obtained on application to the Commercial Intelligence Branch, Board of Trade, 73, Basinghall Street, London, E.C.

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*We have already drawn attention to the bulletins issued by the Board of Trade with the object of assisting British manufacturers and traders to secure trade with British and foreign countries, formerly in the hands of their German and Austrian or Hungarian competitors. In this and the following articles we give some brief extracts from certain of these bulletins, which are to be obtained, it may be added, from the Commercial Intelligence Branch, 73 Basinghall Street, London, E.C.

†The German figures for 1912 and the Austro-Hungarian figures for 1913 have been added to show the magnitude of this trade in a normal year,

ENGINEERS AND TRADING WITH THE ENEMY.

Dissatisfaction at the Imperial Government's Policy—Suggested Boycott by British Manufacturing Engineers.

The British Engineer's Association, which represents British manufacturing engineers with a combined capital of over £100,000,000, has issued a special interim report on trading with the enemy, expressing dissatisfaction at the Government's policy which, it is declared, will have a dangerous effect on British interests.

The Association states that it has received over 200 communications from its members and from engineering firms outside the Association. (a) Asking for advice in connection with trading with German and Austrian concerns in Great Britain; (b) complaining of the injustice of the Government's attitude in not restricting or controlling such firms in the conduct of their trade; and (c) approving the action taken by the Council of the Association in urging the Government to reconsider its attitude in this respect.

EFFECTS OF THE PROCLAMATION.

Proceeding to explain the effect of the Proclamation of the 9th September, the Council states that:—The law relating to trading with the enemy is governed by the "Trading with the Enemy Proclamation No. 2," issued on 9th September, 1914, and the "Trading with the Enemy Act, 1914." The Proclamation permits all people to trade with every German and Austrian (whether naturalised as a British subject or not) residing in Great Britain and elsewhere, except with those actually residing in Germany or Austria, precisely as if Great Britain were not at war with those countries. The mere registration of a company in Great Britain, even if the whole of the directors, the shareholders, the managers and the employees are German or Austrian, makes that company a British concern for purposes of trading. Though the Proclamation does not allow any money to be sent to any enemy in Germany or Austria, any German or Austrian agent in this country can without difficulty evade this provision by passing his remittances to Germany or Austria through a bank or other business concern in a netural country. In a like manner a German or Austrian who manufactures in this country can remit the profits derived from such manufacturing to shareholders in Germany or Austria. Though the proclamation does not allow goods to be purchased from an enemy in Germany or Austria, a German or Austrian agent in this country would have no difficulty in obtaining goods from Germany or Austria through the same neutral channels but for the fact that for the time being the war has reduced the productive capacity of the factories in those countries. Goods from existing stocks carried in Germany and Austria can actually be procured in Great Britain at the present day through a neutral country. The proclamation (clause 5, par. 1) certainly prohibits the payment of money "to or for the benefit of an enemy." This clause, though presumably intended to prohibit dealing even indirectly with an enemy in an enemy country, has no restricting influence on the transactions above referred to owing to the fact that dealing with a neutral country is not dealing with an enemy. Thus this proclamation not only permits alien enemies in this country to trade, thereby keeping their "goodwill" alive during the war to the permanent detriment of the business of bona fide British firms, but opens a means of passing money from Great Britain to Germany and Austria at a time when that money will be used to prolong the war, and consequently to increase the shedding of British blood.

APPOINTMENT OF A CONTROLLER SUGGESTED.

On account of the dangerous effect of this policy the Council has addressed a protest to the British Government urging the revision of the terms of the proclamation, so that, at all events, certain Germans and Austrians in this country, and more particularly (a) those who manufacture in Great Britain and (b) those who act as agents for manufacturers in Germany and Austria should be classed as "enemies." The Council holds the view that a Controller appointed by the High Court should be placed in charge of every manufacturing concern in this country which is owned or controlled by Germans or Austrians, so that no payments can be made by such concerns to individuals or firms in Germany or Austria. The Council also holds the view that all trading with German and Austrian agents in this country should be prohibited. The Council has formulated a definition of the class of individuals and firms located in this country who in its opinion should be considered as enemies, and with whom it is undesirable to trade. The Council has laid its definition before the Government. This definition reads as follows:—

"Every German or Austrian or group of Germans or Austrians resident in Great Britain or in any other country, and every incorporated concern registered in Great Britain or in any other country whose capital, management or interests are wholly or preponderatingly under German or Austrian influences is to be regarded as an 'alien enemy' and irrespective of whether such Germans or Austrians or the concerns controlled by them are manufacturing in Great Britain or in any other country, or whether they are not manufacturers irrespective of whether the parties concerned have taken out papers of naturalisation in Great Britain or in any other country unless such parties can show that their act of naturalisation was prompted by motives which are not detrimental to British interests. The status of the parties concerned shall be determined by their actual status on 1st June, 1914, and no transference of shares, reconstruction of boards or managements, changing of names or handing over of businesses which may have taken place since that date shall be recognised as affecting this definition."

NO DEALINGS WITH THE ENEMY.

The Council puts forward these recommendations:—

Although the Proclamation places no restriction on trading with Germans and Austrians in this country, it contains nothing which obliges British firms to deal with such individuals or firms. On this ground the Council considers that no one in this country who can possibly avoid doing so should enter into any sort of trading transaction with individuals or firms who come under the above definition. Although the Proclamation makes it perfectly clear that anyone may buy from or sell to alien enemies in this country, the prohibition from paying money "for the benefit of an enemy" would make it appear that anyone who pays money to a German or Austrian concern in Great Britain might be liable to severe penalties in the event of it being ascertained that any or all of the money thus paid had eventually found its way indirectly to Germany or Austria. On this ground the Council considers that all payments to such people should be suspended for the time being, except to those alien enemy manufacturers whose businesses have been placed in the hands of a Controller appointed by the High Court.

In conclusion, it is stated that the association has collected and filed particulars relating to the constitution of a considerable number of firms in this country who have interests in Germany and Austria, and has investigated, and is open to investigate, the constitutions of firms whose names are submitted by members. Any information on this subject which is in the hands of the association is at the disposal of members, who, however, are warned that there are many bona fide British firms whose names might make it appear that they were German. Again, members have often been misled as to the bona fides of certain British firms owing to the fact that German firms have registered themselves under very similar titles.

The Council's report has been sent in duplicate to all members, who are requested to send a copy of it to their local members of Parliament, irrespective of party, inviting them to support any measure which will effect a revision of the terms of the Proclamation on the lines suggested,

Rhodesian Section.

LATEST MINING NEWS.

Bell Reef—Scottish Mashonaland Gold—Eldorado Banket—Golden Kopje Proprietary—

The annual general meeting of the Bell Reef Development Company, Ltd., was held recently at 8, Old Jewry, E.C. Mr. R. G. Fricker presided, and moved the adoption of the report for the year ended March 31 last. He observed that now the plant had started and the company had arrived at the profit-making stage, development was being actively resumed. The report was adopted.

* * * *

The report of the Scottish Mashonaland Gold Mining Company, Ltd., for the year ended 30th June, 1914, presented at the meeting on 6th inst., states that the reduction of capital as authorised by the special resolution of shareholders passed on 13th and 30th October, 1913, was confirmed by the Court on 13th January, 1914. The nominal capital is, therefore, reduced from £150,000 to £86,975, and the denomination of the shares from £1 to 10s. each. The issued capital now consists of £63,025 in 126,050 shares of 10s. each all fully paid and 47,900 shares in reserve. The company owns fifty mining claims situated in the Lomagundi and Mazoe districts of Rhodesia. All these claims are let on tribute, and a return of £492 has been received on that account during the year under review, of which £225 has been applied to writing down the book value of the Venus claims from £250 to £25. As the result of the reduction of capital, the book cost of the company's investments has been reduced from £125,308, as shown by the last balance sheet, to £65,697, as at 30th June, 1914. The market value of these assets at that date was £37,402. The depreciation thus shown is due to the general shrinkage in values of securities caused by the continued financial depression, and recently as the result of complications arising out of the war now in progress. The assets remain practically the same as at 30th June, 1913. The Gold Fields Rhodesian Development Company, in which this company has a considerable share interest, shows marked progress, inasmuch as crushing has commenced on the properties of the Antelope Gold Mine (Rhodesia), the Bell Reef Development Company, the Falcon Mines, the Golden Kopje Proprietary Mines and the Shamva Mines, and the profits derivable through these subsidiary companies should secure a permanent and progressive income to the parent concern. Owing to the causes mentioned, the income from investments has somewhat decreased, and no opportunity has occurred for realising any of the assets on favourable terms. A debit balance of £335 is, therefore, shown in the profit and loss account for the year, which amount deducted from the £734 brought forward leaves £399 at the credit of that account. In view of the continued depression in financial conditions the directors have agreed to further reduce their fees to £250 per annum, to take effect as from 1st October, 1914.

* * * *

Mr. Piper's expectation that the dyke, which so seriously shortened the pay shute at the 13th level of the Eldorado Banket, would not affect the 14th level to nearly so great an extent is borne out by the event, as the annexed contrast proves:—

Level.	Length of Pay Shute.	Average Width. Inches.	Value. Dwt.
No. 9	110 ft.	72	28·3
No. 10	105 ft.	88	17·9
No. 11	120 ft.	102	16·3
No. 12	130 ft.	134	12·9
No. 13	65 ft.	120	20·4
No. 14	95 ft.	82	19·2

This strengthens confidence in the prediction that the influence of the dyke will disappear at succeeding levels. It will be noticed, however, that, while the excellent value obtained on the 13th level is fairly maintained, the ore body has contracted considerably in width, and, in fact, the dimensions indicate a rather less tonnage at the 14th than at the horizon above. If the dyke cut off the reef at the 13th level it compensated for it in other directions, and its profit-earning potentialities are probably greater than those of the three immediately preceding levels, and the 14th level will not be far behind.

* * * *

The report of the Golden Kopje Proprietary for the quarter ended 30th June, 1914, states:—Ore reserves: Total, 255,238 tons; average assay value, 7·31 dwts. In addition there are partially developed 55,508 tons, average assay value 11·83 dwts. Capital expenditure, £36,986. "Since the 30th June all construction work has been practically completed, and, as stated at the annual general meeting of shareholders, it was expected that the full plant would be running at the end of July last. On the 24th July, however, an accident occurred to the generator engine, which was not repaired until the 10th August, since when everything has been proceeding satisfactorily. The visiting local director, writing from the mine on the 6th August, reported that the stopes were looking very promising and that samples taken had given results entirely up to expectations. In order that the company's operations may be safeguarded from interruption during the continuance of the war steps have been taken which it is hoped will keep the mine fully supplied with cyanide, zinc, explosives and other mine stores, and arrangements have been made for the storage of gold pending shipment, as well as for incidental banking facilities."

MINING INSTITUTE.

TEACHING CENTRES:—{ JOHANNESBURG AND SCHOOL OF MINES, KIMBERLEY.

Prof. YATES prepares candidates for the following Government Certificates:—
MINE MANAGER'S. MECHANICAL ENGINEER'S.
MINE OVERSEER'S. ELECTRICAL ENGINEER'S.
MINE SURVEYOR'S
by Class, Private Tuition, and Correspondence.

SOME 1914 RESULTS:—
MANAGERS - - - January and May - - ALL Passed.
ELEC. ENGINEERS - February - - - - - 66% ,,
MECH. ENGINEERS- June (Kimberley Centre) - - ALL ,,
MINE OVERSEERS - - - - - - Practically ALL ,,
NEARLY 200 SUCCESSES. St. James' Mansions, Eloff Street.

Situations Wanted.

MECHANICAL ENGINEER (Certificated) with fair knowledge Electricity and Gas Plants, wants engagement. Age 29. Several years' experience mine work. Reply "Certificated," *S. A. Mining Journal*, Box 963, Johannesburg.

Wanted position as COLLIERY MANAGER or ASSISTANT to same in Union of South Africa or Rhodesia. Advertiser holds such a position at present; with First Class S.A. qualification and three years' Transvaal mining experience, also practical knowledge of Oil Shale prospective development. Reply, "CARBON," c/o "S.A. Mining Journal," Box 963, Johannesburg.

RHODESIA'S MINERAL OUTPUT IN SEPTEMBER.

Details of Production—Progress Maintained—Good Showing by New Producers.

We have received for publication from the office of the Rhodesia Chamber of Mines (Incorporated) the following detailed statement of the mineral output for the month of September, 1914, with comparisons and values:—

MATABELELAND.

	No. of Stamps.	Tons Treated.	Yield. ozs.	Value. £
Bulawayo District—				
Abercorn (W. J. Lane)	5	142	53·96	224
Antelope G.M. (Rhod.), Ltd.	2B 2P 1T	3,948	1,133·35	4,698
Do. (slimes)	—	3,554	994·62	4,123
Antenior (W. J. Lane)	5	306	57·24	237
Do. (sands)	—	276	19·55	81
Atlas (Est. R. Barkley)	10	361	66·06	274
Dt. (sands)	—	315	11·81	49
Basch (Morrison & Granger)	5	200	67·32	279
Bassick (Bassick M. Syndicate)	5	116	83·58	346
Bobs (F. W. Spencer)	1C	600	75·32	312
Borrow (W. H. Robinson)	2	302	33·94	141
Bucks Reef G.M., Ltd. (J. Black)	5	848	295·44	1,225
Do. (sands)	—	619	57·42	238
Bulawayo Main A. (R. Aserman)	4	59	25·61	106
Bushtick Mines, Ltd.	28 3T	4,626	282·65	1,172
Do. (sands)	—	2,717	475·97	1,973
Do. (slimes)	—	2,198	136·07	564
Camp (Carson Gold Mine)	5	390	95·72	397
Canther (M. & G. Hogg)	2	230	94·77	393
Claremont (B. L. Whyte)	10	896	66·00	277
Do. (sands)	—	150	11·69	49
"C" (D. & C. Syndicate)	10 1C	1,005	72·64	301
Do. (sands)	—	870	42·77	177
Do. (slimes)	—	135	79·09	328
Clean Up (Carson G.M.), sands	—	750	40·06	166
Colleen Bawn (Colleen Bawn Synd.)	6 2P	976	79·87	331
Do. (sands)	—	340	67·44	280
Do. (slimes)	—	636	151·05	626
Eagle A. (Raymer, Keith and Macdonald, Ltd.)	10	1,006	265·54	1,101
Do. (sands)	—	462	50·95	211
Elumba A. (Cooper & Bosomworth)	5	600	138·98	576
Do. (sands)	—	300	65·33	271
Farvic (H. S. Henderson)	5	759	268·83	1,114
Do. (sands)	—	448	8·02	33
Flora (E. E. Beecroft)	5	698	216·31	897
Formby (Baldwin & Nield)	3	207	106·38	441
Fred (Transvaal & Rhod. Est., Ld.)	10	1,950	1,181·21	4,897
Do. (sands)	—	1,950	316·10	1,310
Glass A. (Stevenson & Kerr)	5	84	22·58	94
Godwin (Barrett & Stacey)	5	154	191·28	793
Do. (sands)	—	112	50·80	211
Golden Butterfly (Wheeler, Davis and Rintoul)	5 1P	522	108·33	449
Do. (concentrates)	—	2	24·49	101
Halley's Comet (Stevenson & Kerr)	(5)	15	13·52	56
Intabanenda (Est. R. Smallie)	5	265	94·76	393
Do. (sands)	—	180	19·58	81
Jeffs (Horton & Stewart)	3	95	89·48	371
Jumpers (J. P. McCay)	5	550	192·89	800
Do. (sands)	—	300	45·31	188
Kameel and 1W. (Yellow Jacket Syndicate)	—	578	87·87	364
Do. (sands)	—	725	43·48	180
Lone Hand (Armstrong, Furber and Alexander)	5	400	175·05	726
Do. (sands)	—	260	35·00	145
Lonely Reef G.M. Co., Ltd.	20 3T	4,640	649·13	2,691
Do. (slimes)	—	4,640	2,544·18	10,547
Long John (Susanna Mines, Ltd.)	13	1,853	130·84	542
Do. (sands)	—	1,853	236·52	980
Mamba (Johnson & Fletcher)	5	150	46·73	194
Matabele 3 (Criterion G.M., Ltd.)	10	1,536	233·51	968
Do. (sands)	—	692	46·74	193
Matabele Queen's Co., Ltd.	10	1,715	482·32	1,999
Do. (sands)	—	1,715	401·41	1,664
Do. (slimes)	—	768	92·54	384
Mayfair (Arbery & Hicks)	5	702	193·40	817
Do. (sands)	—	375	45·00	171
Nathan (N. Edwards)	—	4	12·26	51
Nelly (F. D. Roscoe), June	3H	905	717·61	3,014
Do. do. July	—	970	561·86	2,343
Do. do. August	—	670	582·22	2,413
Do. do. September	5	650	508·15	2,107
New Eclipse (J. R. Stewart)	5	581	197·61	819
Do. (sands)	—	300	35·32	146
Oland (C. A. Hakanson)	—	—	7·24	30
Old Nic (Chart. & Gen. E. & F. Co., Ltd.)	15 4P	2,513	528·68	2,192
Do. (sands)	—	1,374	189·44	785
Peach (Peach Syndicate), sands	—	292	52·76	219
Planet (Huntley & Triggs)	5	436	38·43	159
Pot Luck A. (M. B. Kay)	2	63	20·39	85
Princess 2 (C. A. Abbott)	—	—	5·17	21
Rhodesian Queen	(5)	285	52·74	218
Roan	4	370	59·73	248
Roman (T. Berwitz)	(2)	100	19·93	83
Sara (Jubber & Guest)	2	144	25·27	105
Slaney (P. Candon)	3	8	2·11	9
South City (C. E. Taylor)	—	—	15·03	62
Star (Romola Nigel G.M. Co., Ltd.)	5	257	133·78	555
Do. (sands)	—	205	41·31	171
Teutonic	5	250	438·88	1,819
Umvoti (sands)	—	500	30·03	124
Waverley I. (B. L. Whyte)	5	41	6·12	25
West Nicholson (H. Venning), sands	—	1,100	38·61	154
Winifred (Exchange Syndicate)	5	272	104·62	434
Do. (sands)	—	156	37·49	155
Wolley Dog (P. H. Davis)	2	59	72·30	300
Bulawayo district total			18,120·49	75,167
Gwelo District—				
Alderman (Williams & Woodger)	3	200	98·48	408
Ardpatrick (C. Maleham)	3	330	125·11	519
Bedad (A. & B. Syndicate)	5	200	17·90	74
Bell Reef Dev. Co., Ltd.	2B 1T	3,549	1,514·30	6,360
Bonsor B325 (Cornish Syndicate)	5	575	135·27	561
Bonsor B327 (T. Roberts)	10	500	74·59	309
Bowbell (I. Maleham)	5	236	71·35	296
Cactus (Renton & Gray)	5	470	79·97	332
Do. (sands)	—	450	63·22	262
Camelia (S. Levin), sands	—	700	122·13	506
Cinderella (P. Burt)	1E	285	33·20	138
Cissy (G. Nicholson), June	1H	90	12·38	51
Do. (September)	1H	217	43·10	179
Collingwood (Pini & Wearing)	5	450	153·51	636
Csardas (Wolfshall Syndicate)	5	547	574·26	2.380
Do. (sands)	—	367	87·52	363
Do. (slimes)	—	180	33·30	138
Dream (P. S. Warden)	3	60	40·70	169
Dunraven (New Dunraven G.M.)	5	804	113·11	469
Do. (sands)	—	700	40·22	167
Eileen (M. L. Price)	5	246	37·91	157
Falcon Mines, Ltd.	12 1T	8,117	2,072·35	8,704
Do. Copper, £8,455.				
Fenella (J. Kinrade)	5	20	11·20	46
Gaika G.M. Co., Ltd.	5 1C	3,388	1,448·15	6,082
Do. (sands)	—	1,507	100·12	420
Do. (slimes)	—	2,000	156·75	658
Gartley (Mrs. A. J. Grant), sands	—	120	27·30	113
Do. Mill clean up	—	—	2·58	11
Glen Rosa I. (D. H. Curry)	5	97	161·45	669
Do. (sands)	—	250	111·26	461
Globe & Phoenix G.M. Co., Ltd.	40 10P	6,104	7,529·02	31,622
Do. (sands)	—	5,544	1,264·69	5,312
Do. (slimes)	—	1,913	352·54	1,481
Do. (concentrates)	—	256	468·37	1,967
Gothic and Pagamesa (Mashonaland Agency, Ltd.)	15 2P	1,360	256·38	1,068
Do. (sands)	—	1,020	292·16	1,211
Gretna Green (M. L. Price)	5	60	43·74	181
Invulnerable	5	48	33·05	137
Kings (P. S. Warden), slimes	—	422	48·84	202
Little Blossom (J. Hazlehurst)	2	90	70·60	293
Do. (sands)	—	250	79·18	328
Meg (J. M. Havnar)	2	374	34·17	142
Moss (W. M. James)	2	420	254·73	1,056
Do. (sands)	—	508	38·21	158
Multum (W. Cock)	2	40	5·13	21
Paradox (Bolt & Franks), August	5	270	91·93	381
Do. do. September	5	400	122·72	509
Do. (sands)	—	600	26·82	111
Pretty Polly (Rhodesia G.M. Investment Co., Ltd.)	5	566	113·98	472
Do. (sands)	—	310	16·81	70
Redhill Development Co., Ltd.	1 C	3,475	38·85	161
Do. (sands)	—	1,503	150·19	623
Shamrock (Grampin and Masters), August	10	720	92·19	382
Do. (sands)	—	300	14·86	62
Do. (September)	10	750	122·27	507
Do. (sands)	—	500	21·90	91
Shannon (A. Malcolm)	5	140	16·56	69
Somerset (D. J. Laing)	2	300	74·92	310
Do. (sands)	—	185	47·03	195
Spiral (C. C. Stack)	2	30	27·05	112
Tebekwe B 81 (A. N. Tyrrell)	15	450	179·28	743
Tebekwe 1 (A. N. Tyrrell)		1,393	237·49	985
Do. (sands)	—	1,200	86·58	359

	No. of Stamps.	Tons Treated.	Yield. ozs.	Value. £
Trixie (S. Levin)	10	1.570	200·90	833
Wait and See (Hughes, Sumner and Straub)	2	80	22·29	92
Wanderer (Selukwe) G.M., Ltd.	4 GR	12,160	1,513·03	6,272
Welcome Back (F. C. Luxat)	2 1H	760	134·70	558
Do. (sands)	—	556	34·64	144
Yankee Doodle (Bruhns & Schwarz)	10	1,388	228·49	947
Do. (sands)	—	931	109·16	453
Gwelo distr'ct total			22,072·46	92,317

Matabeleland total .... 40,192·95 ozs.
Value £167,484

MASHONALAND.

Hartley District—

	No. of Stamps.	Tons Treated.	Yield. ozs.	Value. £
Eiffel Blue (Willoughby's Cons. Co., Ltd.)	10	1,282	621·23	2,575
Do. (sands)	—	804	46·31	192
Eileen Alannah Mining Co., Ltd.	10	1,827	953·34	3,952
Details not received	—	—	13,216·26	55,261
Hartley district total			14,837·14	61,980

Lomagundi District.—

	No. of Stamps.	Tons Treated.	Yield. ozs.	Value. £
Alluvial (A. Smith)	—	—	11·80	49
Do. (E. A. Warry)	—	—	34·18	142
Eldorado Banket G.M. Co., Ltd.	15 2C	5,249	1,746·69	7,336
Do. (sands)	—	4,921	508·00	2,134
Do. (reserve)	—	—	260·00	1,103
Golden Kopje Prop. Mines, Ltd.	35 3T	13,610	286·77	1,204
Do. (slimes)	—	6,346	603·31	2,534
Gondia (J. A. Morris)	5	350	32·89	136
Lone Hill (E. A. Day)	5	60	11·66	48
May (May Syndicate)	5	400	124·38	516
Do. (sands)	—	300	70·50	292
Mediteraneo (Perhat & Baburizza)	2	60	22·23	92
New Bonanza	1D	23	3·96	16
New Celtic (Howard & Southey)	2	309	60·62	251
N.G.F. Main W. Ext. (Amalgamated Props. of Rhodesia)	2	78	24·13	100
Lomagundi district total			3,801·12	15,953

Mazoe District.—

	No. of Stamps.	Tons Treated.	Yield. ozs.	Value. £
Alligator (Athey & Loosley), Aug.	6	30	11·92	49
Do. do. Sept.	6	55	12·46	52
Botha H.	5	2.100	96·27	399
Do. (sands)	—	900	117·94	489
Day Dawn	2	346	297·31	1,232
Do. (sands)	—	70	32·20	134
Jumbo G.M. Co., Ltd.	30	2,050	378·16	1,607
Do. (sands)	—	1,350	106·86	454
Do. (slimes)	—	700	46·34	197
Kimberley (Mash.) G.M. Co., Ltd.	8 2T	4,950	1,081·72	4,484
Do. (sands)	—	1,800	444·16	1,841
Do. (slimes)	—	3,150	343·46	1,424
Mitre (Bishop's Syndicate)	1D	7	18·74	78
Do. (sands)	—	15	6·84	28
Micky (clean up)	—	—	10·63	44
Plum (Harries & Cook)	2	150	14·18	59
Do. (sands)	—	150	31·18	129
Rand (Micky Syndicate)	2	585	245·39	1,017
Ravine (H. O. Coker)	2	228	74·18	308
Tat (Oceola G.M. Co., Ltd.)	5	520	198·44	823
Do. (sands)	—	320	36·36	151
Venus (Giles & Southey)	—	137	57·48	238
Yellow Jacket (J. Burger), sands	—	350	12·38	51
Mazoe district total			3,674·60	15,288

Salisbury District.—

	No. of Stamps.	Tons Treated.	Yield. ozs.	Value. £
Arcturus (L. Chiappini), sands	—	700	93·58	388
Ceylon (Monarch (Tati) G.M. Syd.)	5 1P	886	418·06	1,733
Do. (sands)	—	886	280·14	1,161
Crown (Diggers' Syndicate)	2	110	88·11	365
Cross Your Luck, August	—	216	52·06	216
Do. September	—	212	59·24	245
Found A. (O. W. Kelly)	2	157	105·37	437
Fungwiland (Arab Syndicate)	D	103	31·28	130
Inyague (sands)	—	650	73·79	306
Joker (Harrison & Drabble)	—	230	91·40	379
Koodoo (R. Tryon)	—	101	26·32	109
Louise Grand (H. S. Plant)	1H	1,150	69·56	288
Do. (sands)	—	1,050	69·83	289
Mont d'Or (Claxton & Bussell)	2	94	111·45	462
Do. (sands)	—	350	42·66	177
New Agnes	5	247	71·50	296
New Full Back	2	280	61·19	254
Olympus (clean up)	—	—	·70	3
Old Loyalty (Shamva Ilex G.M. Co., Ltd.)	5	480	131·42	545
Radnor 1 (London and Rhodesia M. & L. Co.)	5 2P	394	456·92	1,894
Shamva Mines, Ltd.	56 2T	27,792	1.376·09	5.779
Do. (sands)	—	11,646	1,130·45	4,748
Do. (slimes)	—	16,039	1,695·63	7,122
Do. (by-products)	—	—	185·91	781
Salisbury district total			6,722·71	28,107

Umtali District.—

	No. of Stamps.	Tons Treated.	Yield. ozs.	Value. £
Arthur (F. R. Myburgh)	1 H	—	4·85	20
Cairndhu (E. K. Evans), sands	—	180	15·00	62
Champion (J. Buchanan)	5	870	89·37	370
Do. (sands and slimes)	—	510	133·83	555
Fairview 3 W. (Branken and Markham)	5	100	50·66	210
Do. (sands)	—	245	15·40	64
Golden Adelaide (F. E. Markham)	(5)	100	10·92	45
Do. (sands)	—	105	5·74	24
Golden Frog (S. W. Roberts)	1C	41	4·39	18
Inca (F. Young)	8	220	43·40	180
Kent Mines, Ltd.	10	980	286·44	1,187
Do. (sands)	—	760	65·50	272
Liverpool (R. G. Snodgrass)	5	600	87·73	364
Do. (sands)	—	250	49·62	206
Montezuma No. 2	5	600	157·16	651
Pilgrim 2 E. (O. R. Cawood)	10	785	99·80	414
Quagga (Thompson, Murdock and Kapnek)	5	370	76·25	316
Do. (sands)	—	480	15·20	63
Rezende Mines, Ltd.	115	15,900	1,550·22	6,578
Do. (sands)	—	2,740	361·92	1,536
Do. (slimes)	—	916	83·13	353
Do. (concentrates)	—	154	542·50	2,271
South Perthshire (Umtali Waterfall Syndicate), sands	—	68	22·25	92
Surrey (Keir & Rooke)	—	500	145·29	602
Umtali district total			3,916·57	16,453

Victoria District—

	No. of Stamps.	Tons Treated.	Yield. ozs.	Value. £
Empress (S.A. Prospecting and Concession Syndicate, Ltd.)	5	926	164·73	683
Do. (sands and slimes)	-	483	93·32	387
Reinhold (R. R. Schielke)	5	198	23·50	97
Texas (G. Scott)	10	1.650	592·13	2,455
Do. (sands)	—	775	122·89	509
Victoria district total			996·57	4,131

Mashonaland total .... 33,948·71 ozs.
Value £141,913

Total gold production .... 74,141·56 ozs.
Value £336,981

OTHER MINERALS.

			Value.
Silver, ozs.	14,756·61	......	£1,366
Lead, tons	12·44	......	206
Copper, tons	169·09	......	8,455
Chrome iron, tons	3,248·00	......	7.250
Coal, tons	30,471·00	......	9,857
Diamonds, carats	91·5	......	456
Grand total value of production			£336,981

GOLD OUTPUT COMPARISONS.

	Ounces		Value.
August, 1914	75,998·96	.....	£316,972
September, 1914	74,141·66	......	309,397
Decrease	1,857·30	......	£7,575
September, 1914	74,141·66	......	£309,397
September, 1913	59,534·87	......	250,429
Increase	14,606·79	......	£58,968

GRAND TOTAL OUTPUT.

Totals to date: Gold, 7,028,061·97 ozs.; silver, 1,819,077·90 ozs.; lead, 7,025·07 tons; copper, 614·51 tons; chrome iron, 321,093·21 tons; coal. 1,863,017 tons; tungsten ores, 129·10 tons; antimony. 13·75 tons; arsenic, 76 tons; asbestos, 1,533·24 tons; diamonds, 10.445·88 carats; other precious stones, 90,069·50 carats.

C.: Chilian mill. T.: Tube mill. G.R.: Gates' roll. H.: Huntington mill. P.: Grinding pan. Pn.: Pneumatic mill. D.: Dolly.

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Correspondence and Discussion.

Comments on Questions Arising in Technical Practice or Suggested by Articles in the Journal—Views, Suggestions and Experiences of Readers.

A Special Mining Court.

To the Editor, *South African Mining Journal.*

Sir,—In view of the case in the High Court this week, may I again draw attention to the fact that some years ago the Mining Regulations Commission made an enquiry into the laws affecting work on the mines of the Transvaal. Amongst the many points dealt with was the system for trying cases arising under the mining regulations. The Commissioners had pressed upon them the argument that it was unfair to expect the ordinary magistrate to be acquainted with the technicalities of mining, and that therefore in many cases, especially where a regulation had been framed for the purpose of protecting life and limb, " the punishment which might be inflicted would, in consequence of their inexperience, be entirely disproportionate to the gravity of the offence." The Commissioners agreed that it was " quite evident that no one is competent to adjudicate on such cases unless he has a working acquaintance with underground conditions, and understands the reasons why certain regulations have been framed." They accordingly reported that they had " come to the conclusion that in order to ensure efficient enforcement of the regulations, the appointment within the Witwatersrand area of a single magistrate to try all mining regulations cases is advisable, and strongly recommend that this be done." Comment is superfluous.—Yours, etc.,

" MINER."

"Made in South Africa."

To the Editor, *South African Mining Journal.*

Sir,—Public bodies, Government and officers of State of the highest rank in Great Britain are vieing with each other in ardent preparations to conquer Germany in industrial and commercial matters, as in the field of battle. With statesmanlike foresight, even Cabinet Ministers are lending their weightiest help towards the future predominance of British and British-Colonial trade within the Empire, and it is for us in South Africa to do our best to assist. And in view of the early production of my book, " Made in South Africa," written especially to induce and encourage local production—especially in opposition to future imports from Germany and Austria—it is interesting to note that the British Board of Trade, the Imperial Mission, and every Chamber of Commerce in the United Kingdom, with the active assistance and approval of the Secretary of State for the Colonies, the Secretary of State of Foreign Affairs, Sir Edward Goschen, the late Ambassador at Berlin, and other public-spirited gentlemen, are using every effort just now to prepare not merely to annihilate Britain's former trade with Germany and Austria, but to create a manufacturing industry in Britain and Ireland in place of it. And that is what we South Africans have to do also. We have not only to eradicate South Africa's imports from Germany and Austria, but to create such an ambition for South African industries and production, throughout this great country, that never again shall such trade disfigure our customs returns. In this connection, the London *Daily Telegraph* of September 28th says, " big retail houses can help materially in the matter. If they will make public announcement that they will not sell goods of German and Austrian origin, they will find sympathetic support from their customers." And I am sure that this argument applies with equal force here in South Africa, and here in Johannesburg. The *Daily Telegraph* goes on to deal with another phase of this most vital subject. In alluding to the fact that British manufacturers and producers may find difficulties, from a financial point of view, in inaugurating factories and plants, or in increasing existing plants, the *Telegraph* says:—" If British manufactures and tradesmen and mechanics are to benefit, they will have to embark upon a bold policy, and if—true to conservative traditions—banking institutions withhold help, then Government will have to do something to remedy the lack of patriotic enterprise which may be shown by the banks." These are important prognostications, and deserve ample consideration now from South African merchants, tradesmen, financial institutions, and Government alike. In the near future (let us hope) the war will have been brought to a successful issue for Great Britain. Trade throughout the British Empire must expand by leaps and bounds, and South African trade and manufactures, productions and industries, will expand with it; and for the future, instead of buying from oversea (and especially from any foreign sources) South Africa must become as great an industrial and producing country as any other part of the Empire—if capital is available; and this is where the Union Government must step in to help the producer and manufacturer, wherever necessary, with whatever monetary assistance that may be needful. If our banking institutions are (as the *Daily Telegraph* terms it) too " true to conservative traditions " to foster South Africa's powers of internal prosperity, Government must help so that goods of every description, made and grown, produced and manufactured, within our own borders, may for all future time take the place of goods " made in Germany." Our hard-earned ready-money must be retained in our own midst, it must circulate among our own people, and it must be spent by South African and earned by South Africans. If consumer and producer alike will work together with that as their common aim, and if the South African producer will deign to wake up, and if our merchants and tradesmen will learn truly patriotic sentiment, then the ultimate result will be surprisingly satisfactory to the whole people of South Africa.—Yours, etc.,

JAMES CUMMING.

P.O. Box 90, Johannesburg.

[The encouragement of South African production by every legitimate means has always been strongly advocated by this paper.—Ed.]

The following is a list of certificates issued by the Mines Department for the period 1st September, 1914, to 23rd October, 1914:—Mine managers: Metalliferous mines: N. Rogers, A. P. Fletcher, P. A. Rogers, E. L. Adams, H. S. Ball, G. D. Stephen, C. Y. Bruce. Collieries: H. Birrell, R. Gascoyne, A. Clacher. Diamond mines: D. Brown. Open cast diamond mines: J. West. Mine Overseers: Metalliferous mines: F. C. Honey, E. Jenkins, C. N. Hutchons, M. Roach, A. Jewell, B. Mortimer, J. B. Jobling, J. Finnie, J. Canning, E. S. Burley, A. Jenkin, W. Barwise. Collieries: P. Gerrard.

Apex Coal.

Tonnage of coal disposed of, 43,658; profit estimated at £5,653 13s. 5d.; capital expenditure, £892 16s. 9d. In addition to the foregoing profit, on the 18th August, 1914, an amount of £7,500 was received, being dividend at the rate of 5 per cent. on the 150,000 New Kleinfontein Company, Ltd., shares held by the company.

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VENTERSBURG ROAD, O.F.S.

POSITION OF ROOIBERG TIN.

Improved Extraction—Reduced Working Costs—Effect of the War on the Metal Market—Arrangement with Employees.

THE annual meeting of the Rooiberg Minerals Development Company was held in the board-room, National Bank Buildings, on Wednesday. Colonel W. Dalrymple presided, and others present were Messrs. W. McCallum, J. Munro, W. J. Gau, M. G. Elkan, J. A. P. Gibb, A. G. Gill, L. J. Bourne, E. J. Way, J. Roy, G. McBean, C. P. Marais, A. W. Bannerman, and L. S. Raymond (secretary).

The Chairman, in moving the adoption of the report, said, *inter alia*:—The profit and loss account reveals that a balance of £52,149 13s. 3d. was carried to appropriation account. This amount, together with the balance brought forward from the previous year—namely, £17,063—has been dealt with as follows: Dividends Nos. 6 and 7, together 17½ per cent., £31,509; amount appropriated to capital expenditure for additions to the reduction works, etc., £9,926; amount transferred to the reserve fund, £5,000; carried forward to the current year, £22,787; total, £69,213. The additions to the reduction plant, together with those made in the previous year, have resulted in an increase in the percentage of extraction of 5·96 per cent., as compared with last year, and are therefore fully justified. The demand for married quarters on our property is still considerably in excess of the number available. The gross revenue from the sale of concentrates, notwithstanding the increase of 98 tons in production, was £152,889, as compared with £184,868 for the previous year, or a reduction of £31,979. The average price of metallic tin in 1912-13 was £218 per ton, whereas in 1913-14 it only averaged £174. The quantity of black tin recovered was 1,294 tons, of an average grade of 68·51 per cent., as compared with 1,196 tons, of an average grade of 69·54 per cent., for the previous year. The tonnage of ore milled ex mine and prospecting dumps was increased by 7,439, but sands and slimes retreated were less by 2,713 tons, or a net increase of 4,726 tons; the grade of ore treated showed a decrease of 0·38 per cent. The working costs per ton were £2 7s. 9d., including 14s. 5d. for development, exploration and shaft-sinking, which is a decrease of 6s. 1d. per ton milled, as compared with last year. The total footage driven, risen and sunk was 10,119 feet in the mine, exclusive of exploration and prospecting. This is practically the same footage as was effected in the previous year.

SOUND POSITION.

As you will see from the reports of the consulting engineer and manager, development results have not differed materially from those of previous years. Development in depth—that is, on the 310 feet and and 410 feet levels—has been disappointing; but a great amount of work requires to be done on these and lower horizons before we can assume that there is any persistent impoverishment in depth. In normal times it will be our policy to return to these points and continue the work of development. With regard to prospecting and exploratory work, 3,513 feet of driving and sinking and 3,461 feet of surface trenching, of an average depth of 6·1 feet, has been carried out during the year; the total cost under this heading was £7,970 6s. 2d. The results obtained from this expenditure have been in every way satisfactory, as many pockets of high grade ore of varying dimensions have been exposed. The ore at grass at the prospecting dumps on September 30 of this year was 4,773 tons, of an average of 8·1 per cent. metallic tin. This tonnage shows an increase of 931 tons since June 30, 1913, notwithstanding that the ore crushed from prospecting dumps during the year was 2,296 tons. The pockets that are found as a result of this work lie under the overburden, and are scattered over a large area; the surface in most cases gives little or no indication of such ore bodies, nor their values. It is only on clearing the overburden that these enrichments are discovered. Your balance sheet shows a sound position. You will notice that the property account has been increased by approximately £800, being the cost of acquiring the remaining portion of the surface rights, in extent 298 morgen 443 square roods of the farm Hartebeestefontein No. 310. The whole of the above-mentioned farm, both freehold and mineral rights, is now your property. The consulting engineer in his report estimates that at the close of the year the reserves, ore at grass and accumulated middlings and slimes to be retreated totalled 43,237 tons, of an average value of 4·2 per cent. The larger portion of our output has been sold to the Straits Trading Co., Ltd., and our trade relations with that company have, as in the past, been very satisfactory. I am pleased to be able to state that the health of the camp has been good, and malarial fever, which in the early years of the company's history was such a serious menace to the public health, has, owing to the precautions taken, almost disappeared from the immediate neighbourhood.

THE EMPLOYEES.

At the last annual general meeting I referred to our native labour supply, which is entirely voluntary. This has again been sufficient for our requirements, and, although the company is a member of the Native Recruiting Corporation, we have fortunately not had to call upon them for any natives during the year. As probably you are aware, on the outbreak of war the metal exchanges of the world closed, and no official dealings have since taken place. Consequently, such sales as we have effected in the interim have been carried through by private treaty. On September 30 we had 140 tons of concentrates unrealised on hand. In the interim, no further realisations have been definitely concluded. The position at the moment is that we have 56 tons in England, 100 tons on the water, and approximately 60 tons at the mine and en route to the coast. When the closing of the metal exchanges took place, the directors immediately considered the whole position very carefully, especially in regard to the continuance of work on the mine. The matter had to be viewed from the standpoint of the employees, as well as that of the shareholders, and, after careful consideration, I think you, as shareholders, will agree that we have done the right thing in endeavouring to keep the operations going at as full capacity as possible, and we shall endeavour to continue this policy, but this is governed by the prices obtained for our product, as, if we cannot make satisfactory realisations, our cash would soon be exhausted, and we cannot prejudice the stability of the company through getting into debt. The position was put to the employees, and they were asked if they would continue work at half pay. The employees, as a whole, from the manager downwards, loyally stuck to the company, and with very few exceptions cheerfully accepted the proposition. This reduction has also been applied to all the directors', consulting engineer's, and secretarial fees, etc. I feel sure that shareholders will be as anxious as the board to make up to the employees at a later date the amount of the reductions, but this is dependent on the realisation price of the concentrates produced. There is, however, no legal liability to the company in connection therewith. As a further step towards keeping our expenditure as low as possible during the war period, your board decided to suspend, temporarily, development operations in the main mine. Surface prospecting is, however, being carried on at an increased scale.

Mr. McCallum seconded the motion, which was agreed to.

The appointment was confirmed of Mr. W. J. Gau as a director in place of Mr. G. W. Higgins, resigned.

The retiring directors, Messrs. W. Dalrymple and J. Roy, were re-elected.

Messrs. Alex. Aiken & Carter were appointed auditors for the ensuing year.

Finance, Commerce, and Industries.

Portland Cement.

At the recent annual meeting of the Associated Portland Cement Co., the chairman said, *inter alia*: "Since the report was issued the manufacture of cement in South Africa has begun. Our colleague, Mr. Herbert Brooks, whose absence to-day we regret, has been for some time in that country rendering most valuable service, not only in assisting in the completion of the works, but in preparing the way for the conduct of the trade. You will remember that this is no new market for us; our brands are more appreciated there than any others. In all these countries we cannot, on account of the war, prophesy results for the near future; but, looking further ahead, we maintain full confidence in the policy of manufacturing abroad for certain markets, and in the profitable nature of the returns to be expected. There is no doubt that, alike in our home and in our foreign trade, everything turns upon the course of the war. The command of the sea, so long as it is unchallengeable, is an immense factor in favour of British export trade. Counter-balancing ones are scarcity or high cost, should such exist, of freight, and also of raw material, such as fuel and timber. So far as can now be seen, we take a hopeful view of maintaining a steady, if a diminished trade."

* * * *

South African Trade in 1913.

Sir Sothern Holland, Imperial Trade Commissioner for South Africa, in the course of his report on the trade of South Africa for 1913, deals with important economic questions, and considers it remarkable that trade is so good in spite of the severity of the drought and industrial dislocation. He emphasises that the expansion of the motor industry is stimulating an awakening of the country side. The United Kingdom, he says, enjoyed an increase of nearly nine per cent. in imports into South Africa, but Britain's position is difficult to maintain against the vigour of foreign competition, and the growth of nascent industries in the Union. British firms, he considers, deserve congratulation for meeting the wants of South African farmers.

Beira Railway.

The report of the Beira Railway Company, Ltd., presented at the meeting on the 12th instant, covers the year ended 30th September, 1913, and shows the gross and net earnings of the Beira-Salisbury section, as follows:—1912-13: Gross revenue, £635,352 13s. 6d.; expenditure, £225,096 18s. 8d.; net revenue to Beira and Mashonaland Railways, £410,255 14s. 10d.; percentage of expenditure to receipts, 35·4. 1911-12: Gross revenue, £513,139 18s. 11d.; expenditure, £206,815 16s. 8d.; net revenue to Beira and Mashonaland Railways, £306,324 2s. 3d.; percentage of expenditure to receipts, 40·3. The increase in the gross revenue for 1913 is chiefly due to the carriage of machinery for equipping various mines in Rhodesia and construction material for railway extensions in Rhodesia. The increase in expenditure is only £18,281, against an increase in gross revenue of £122,212. The general goods traffic in 1912-13 was 127,464 tons, yielding £449,757, as compared with 102,104 tons, yielding £376,536 in 1911-12, this showing an increase

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of 25,360 tons carried for £73,221 more revenue. Construction material carried amounted in 1912-13 to 46,553 tons, yielding £83,979, and 1911-12 to 27,140 tons, yielding £38,786. Mineral traffic for 1912-13 shows a decrease in tonnage, being 88,842 tons for £50,362, as compared with 103,980 tons for £50,476 in 1911-12, thus yielding almost the same revenue. The traffic returns for the line from Beira to Salisbury, subject to audit, for the ten months ended 31st July, 1914, are as follows:—Gross revenue, £458,015; expenditure, £191,679; net earnings, £266,336. As compared with the same months in last year, the decrease of about £79,000 in the net earnings is accounted for chiefly by falling off in the carriage of mining machinery and construction material, as well as by reductions in rates.

* * * *

Portuguese East Africa.

There was an increase of £177,187, or 2⅔ per cent., in the value of the trade of the port of Lourenço Marques for the year 1913, mainly in exports and re-exports. Lourenço Marques continues to carry on an important transit trade with the Union of South Africa, and more especially with the competitive area of the Transvaal. It is the principal receiving station for natives going to and returning from the mines, and of recent years it has assumed an important position as a coaling and bunkering port. As our Consul-General at the port says: "British shipping claims the highest tonnage of vessels entered and cleared; the transit dues are paid by the Union of South Africa; the native labourer returns with British gold paid to him as wages on the Rand mines; and the coal exported is the produce of South African collieries." It is added that the local retail trade, with the exception of Portuguese wines for native consumption, is of little consequence, owing to the comparatively small European or civilised population.

* * * *

Responsibility for Goods on S.A.R.

A great deal of anxiety has been felt by merchants by reason of the fact that under Clause 23 of the Tariff Book the Railway Department is not responsible for loss of or damage to goods caused by (*inter alia*) "the acts of the King's enemies." Since the outbreak of rebellion the Department has been accepting goods only at owner's risk. In view of the difficulties which resulted the Chamber of Commerce promptly took the matter up with the Treasury, and the following telegrams passed—from which it will be seen that the Government has fully met the position and the apprehensions of merchants have been removed. The Chamber of Commerce wired to the Minister of Finance (27th inst.): Complaints are being made that on account of the rebellion the Railway Administration is only receiving goods for conveyance at owner's risk under Clause 23 of Tariff Book. The effect of this will be to increase the price of foodstuffs and other commodities, and to check the filling up of stocks. Chamber urges that Treasury should agree to indemnity consignees against losses sustained at the hands of rebels during transit by rail. In view of the importance to all traders it is proposed to publish your reply. The Secretary for Finance wired in response (28th inst):—Reference your telegram of last evening. It is recognised that effect of Railway Administration's action may be as apprehended by Chamber. Government is naturally most anxious to avoid any such consequences. An understanding has therefore been come to with Railway Administration whereby in consideration of Treasury accepting risk in question the Administration reverts forthwith to status quo.

A Proclamation has been issued in London authorising the Board of Trade to enter any premises and take possession of articles of commerce which are being unreasonably withheld from the market.

Manicaland Output.

The mineral output of the territory of the Companhia de Moçambique (Manicaland) for the month of September, 1914, is as follows:—Reef: Mill: Gold won (fine gold), 498 ozs. 7 dwts. 5 grs.; tons, 1,253; value, £2,065 16s. 6d. Concentrates (estimated): Gold (fine), 16 ozs. 0 dwts. 0 grs.; tons, 8; value, £67 4s. 0d.; also contains silver and lead estimated value £40 4s. 1d. Cyanide (estimated): Gold recovered (fine), 30 ozs. 0 dwts. 0 grs.; tons, 275; value, £126. Alluvial: Gold recovered (fine), 870 ozs. 10 dwts. 0 grs.; cubic metres treated, 79,000; value, £3,608 11s. 10d.

The King's Enemies.

The man who hoards gold.

The man who hoards food.

The employer who discharges a man except from the direst necessity.

The man who does anything to disturb the normal condition of business.

The publisher who buys six months' supply of paper.

The man who thinks of his profits before his country.

The man who needlessly cancels a contract.

The man who needlessly takes advantage of the moratorium.

The man who puts up prices except to cover increased costs.

The man who by any exceptional action seeks to protect himself at the expense of his fellow countrymen.

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Engineering Notes and News.

BORING FOR WATER IN THE UNION.

Details of Boring by the Union Government on Dry Farms Previous to Allotment—A Heavy Programme—Highly Successful Results.

DURING last year the policy of the Union Government of boring for water on dry farms previous to offering them for allotment was continued. At the 31st December 129 holes had been drilled on 77 farms in the Transvaal at an average cost of £247 per hole. Of the 129 holes 30 were unsuccessful, and, after deducting the cost of these, the remaining 99 cost on an average £245 each, which may seem high, but it must not be overlooked that the expenditure includes charges for water, fuel and transport. The cost of fuel and transport in isolated areas is frequently very heavy; in one or two instances it has been almost prohibitive. The supply of water for the drill is another difficulty, as it has often to be transported many miles from the nearest supply. 177 farms in the Transvaal were reserved for boring at the end of the year, while investigations were proceeding as to the desirability of boring on 30 farms in the northern part of the Rustenburg district and 105 farms in the Waterberg, Rustenburg and Zoutpansberg district. There is a large number of farms in the Waterberg, Rustenburg and Zoutpansberg not yet specially inspected for boring, which will be readily taken up by a good stamp of settler once water is found thereon. It is clear from past experience that without first finding water there is little or no prospect of obtaining permanent settlers. The drills available for work on Crown lands have, however, a heavy programme of work, and it will be some considerable time before the outlying parts of the districts mentioned are reached. Some of the best cattle raising farms in the Transvaal—in fact in the Union—are at present lying unoccupied and unimproved, and will continue to do so until water is found thereon in sufficient quantities to enable settlers to enter upon and occupy them on a permanent basis. The number of drills operating on Crown lands is as stated hereunder 21, and if settlement of dry farms the property of the Crown is to be materially expedited additional drills must be allocated for work thereon.

BORING FOR LESSEES OF CROWN LANDS.

During the past year 50 applications from lessees of Crown lands for the use of drills were approved, the cost of the boreholes to be added to the valuation of their holdings. Of this number eleven were completed by the end of December at an average cost of £66 each. The low average compared with the cost of drilling on Crown land is accounted for by the fact that the lessees, who for the most part are settled within short distances of one another, have to supply free of cost the necessary transport, water and fuel. Fifteen boreholes were sunk on the holdings of settlers on the settlement at Delmas, in the Pretoria district, the settlers undertaking to repay the cost over a period of five years. The cost of each borehole was on an average £35. There is no doubt that further boring on an extensive scale will have to be undertaken on this settlement during 1914 if the settlers have to contend with another such dry winter as that of 1913. On some parts of the settlement there was for some weeks an entire absence of drinking water for settlers and stock.

WATER SUPPLIES OBTAINED ON VACANT CROWN LANDS.

Generally speaking, boring for water on the vacant Crown land in the Transvaal has been very successful, the average daily supply obtained in such boreholes being about 20,000 gallons. In some cases, however, 80,000 gallons were obtained, while in one instance the supply was estimated at 100,000 gallons. After boring the land is valued for disposal on the basis of the estimated water supply, irrespective of the cost of boring. The summary, which gives particulars as to the distribution of work done in the Transvaal, shows also that the cost of boring incurred by Government is very largely exceeded by the increased valuation at which the land is disposed of.

BORING ON CROWN LAND IN THE CAPE PROVINCE.

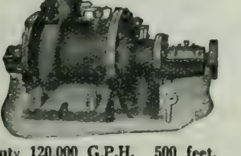
Boring has for some time been proceeding on Crown land in the Cape Province, and it is hoped that in 1914 a substantial number of holdings in the Mafeking and Vryburg districts will be made available for settlement. During the year drilling was carried out on seven farms in the Mafeking district; seven holes were drilled, all of which were successful, the total yield being 171,900 gallons per diem, an average of over 24,000 gallons. The total cost was approximately £1,332, or an average of £190. In the Vryburg district five holes were drilled on three farms, which yielded 80,412 gallons per diem, an average of 16,082 gallons. The approximate cost was £1,346, or £269 4s. per hole.

BORING ON UNOCCUPIED GOVERNMENT FARMS, CAPE PROVINCE.

Boring operations were also conducted on unoccupied Government farms in the districts of Kenhardt and Gordonia, Cape Province. In the former districts four boreholes were sunk on three farms at a total cost of approximately £1,345 or £336 5s. per hole; two of these were unsuccessful. The daily yield from the other two boreholes was 91,000 gallons, or an average of 22,750 gallons per diem in respect of the four holes. The prospect of finding water on the unalienated Crown farms in the Kenhardt district has not so far been encouraging, and it is doubtful whether, so far as Crown land is concerned, better use could not be made of the drill operating there in some other district offering greater prospects of success.

BORING IN GORDONIA, CAPE.

In Gordonia 29 boreholes (in 28 of which water was found) were drilled on 24 farms at a total cost of approximately £3,616, or £124 13s. 9d. per hole, the total daily yield being 462,000 gallons, which gives an average of 15,931 gallons. Unfortunately in 13 of the 28 boreholes the water was too salt to be of use; these are almost entirely on the Crown lands between the junction of the Molopo and Nosop Rivers and the junction of the Oup and Nosop Rivers. The drilling along the Oup River was very successful, and it was intended immediately the border of German territory was reached to experiment along the Nosop River northwards. The finding of supplies of fresh water along the Oup River is a matter of considerable interest, as the area forms one of the outposts of the Union and has been looked upon so far as a veritable "no man's land." No boring was undertaken on Crown lands in the Orange Free State or in Natal.



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Tube Mill Efficiency.

A noteworthy article on the relation of the rate of feed to tube mill efficiency, by Mr. R. T. Mishler (assistant general manager of the Tigre Mining Company, Sonora, Mexico), appears in the New York *Engineering and Mining Journal* of 12th September. According to the author's tests with short (14 ft.) tube mills grinding efficiency increases with the tonnage; but above 200 tons (dry weight) of sands per day the gain in efficiency is small, not offsetting the greatly increased cost of elevation and classification. By raising the feed from 35 tons to 200 tons daily the cost of tube-milling on the Tigre mine has been reduced more than one-half. The reduction has been in proportion to the fall in consumption of power and pebbles. With a light feed the cost of grinding, elevating and classifying per ton of initial sands fed was $1.88 U.S. currency. With a medium feed the cost per ton was reduced to 97 cents. Now, with a heavy feed, the cost has dropped to 68 cents per ton. Mr. Mishler tabulates fully the various results obtained during his tests and gives a graph summarising his conclusions.

Metal Prices.

The following are the latest commercial quotations:—On the Metal Market: Standard copper, £50 15s. per ton; electrolytic copper, £52 15s. per ton; Straits tin, £133 15s. per ton cash, £133 15s. per ton for three months delivery; English lead, £18 5s. per ton.

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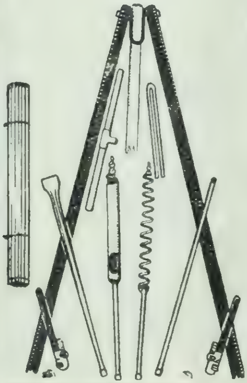

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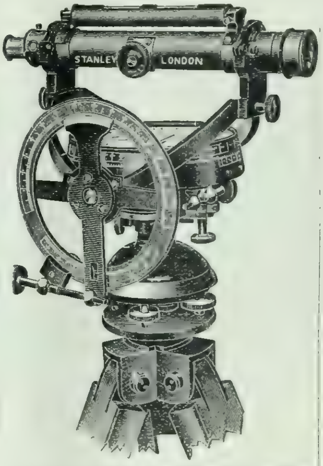

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Mining Journal,

WITH WHICH IS INCORPORATED

South African Mines, Commerce and Industries.

ESTABLISHED 1891.

VOL. XXIV., PART I.] NOVEMBER 7, 1914. [No. 1206.

HEAD OFFICE: 176-180, Stock Exchange Buildings, Fox Street (2nd Floor), Johannesburg, Union of South Africa.

Telephone **913.** P.O. Boxes **963** and **418.**

Cable and Telegraphic Address: "**MINING JOURNAL.**"

AGENTS FOR GREAT BRITAIN: Argus Printing and Publishing Co., Ltd., Byron House, 82-85, Fleet Street, London, E.C.

AMERICA: Advertisements accepted from any recognised Advertisement Agency.

ANNUAL SUBSCRIPTION RATES: Oversea, £2; South Africa (by post), £1 10s.; Local Delivery (Town only), £1 6s.

Copies of this journal are obtainable at all Branches and Agencies of the Central News Agency, Ltd., at all News Agents and Railway Bookstalls throughout South Africa, and at the London Agency as above.

NOTICE.—The postage of this issue of the *S.A. Mining Journal* is: South Africa, ½d. All other parts, 1d.

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Notes and News.

The Rand's New Mills.

As we anticipated recently, the mill at the State Mines started up during last month, and is now running satisfactorily. A cable was sent to London by the company on Friday stating: "Trial runs of machinery during October. No clean up." It is expected that the Modder Deep mill will be at work early next month.

* * * *

War Statistics.

An analysis of the Customs returns for the first eight months of the year, *i.e.*, to August 31, throws light on the incidence of a month of the war. The total value of the imports of merchandise was £22,737,538 as against £25,234,860 for the first eight months of 1913. Government imports, however, increased to £3,091,936 as compared with £1,980,697 for the eight months of 1913. In the list of imports, it is noteworthy that the following increases are shown:—Mining machinery, £17,427; agricultural implements, £42,698; electrical machinery, £72,974; and oils, £18,918. Among the exports for the eight months the value of the gold fell off from £25,673,410 in 1913 to £20,568,837, and diamonds from £8,943,831 to £5,328,614. Coal exports decreased £54,148, but tin and copper ores, strangely enough, were exported to a considerably higher value.

* * * *

Nine Months with the Langlaagte Estate.

The statement of expenditure and revenue of the Langlaagte Estate for the nine months ended 30th September, 1914, shows that 200 stamps crushed 439,308 tons; total working costs, £394,060 12s. 9d.; profit, £136,957 12s. 4d.; for a revenue of £531,018 5s. 1d. Revenue was equal to 24s. 2·10d. per ton milled; expenditure was equal to 17s. 11·28d. per ton milled; profit was equal to 6s. 2·82d. per ton milled. Expenditure on capital account amounted to £20,569 10s. 8d. Development, driven, risen and sunk, 9,234 linear feet. Ore reserves at 31st December, 1913, 1,512,359 tons; depletion, January-September, 1914 (less development), 41,347 tons; total ore reserves at 30th September, 1914, 1,471,012 tons. Ore mined, January-September, 1914, 439,308 tons; waste rock sorted out on surface, nil; milled, 439,308 tons. Machinery and plant is in good order; water supply sufficient; native labour below requirements.

* * * *

The Chartered Meeting.

It will be remembered that the annual report of the Chartered Company was officially foreshadowed to be issued this month. We understand that, despite the mail interruptions caused by the war, it is still confidently hoped to hold the meeting in the last week of November and to present thereat the accounts for the two years ended March last. But there is now no chance of the Judicial Committee of the Privy Council giving its opinion on the ownership of Rhodesian unalienated land before that date.

* * * *

Capturing the Enemies' Chemical Trade.

In furtherance of the campaign to secure for Great Britain trade in neutral markets hitherto in the hands of Germany and Austria-Hungary, the Commercial Intelligence Branch of the Board of Trade has issued a bulletin containing statistics of the trade in heavy chemicals, including aluminous sulphates, arsenic, bleaching materials, coal products, sulphate of copper, cyanide of potassium or sodium, soda compounds, and sulphuric acid. In a recent year the value of these chemicals exported from Germany, Austria-Hungary and the United Kingdom, respectively, was as follows:—From Germany, £4,066,600; Austria-Hungary, £161,565; United Kingdom, £6,684,900. Any British manufacturer or merchant who desires to be furnished with detailed information as to openings affecting his particular business should put himself in communication with the Director of the Commercial Intelligence Department of the Board of Trade, 73, Basinghall Street, E.C.

New Kleinfontein Amalgamation and Increase of Capital.

On the 19th August the following notice was issued to shareholders in the New Kleinfontein Company:—

"With regard to the increase of capital created by the resolution passed at the meeting of shareholders held on the 21st day of July, 1914, and the offer then sanctioned of 115,154 of the new shares to shareholders registered on June 30th, 1914, notice is hereby given that the directors have decided to postpone the issue of letters of rights to shareholders entitled to participate in the subscription for the new shares, until a date to be decided on after 31st October, 1914. The guarantors of the new issue have entered into a supplementary agreement by which the guarantee is extended accordingly. This decision has been come to by reason of the state of war prevailing, and the consequent difficulty and uncertainty of communicating with a large body of the company's shareholders."

As the conditions that obtained when the initial extension of the guarantee agreement was made still exist, the Board has agreed with the guarantors to further extend the operation of the agreement for a period of six months. Under the circumstances the issue of letters of rights to shareholders entitled to participate in the subscription for new shares will be again postponed until a date to be decided upon after the 30th April, 1915.

* * * *

Ocean Freights and the War.

On the 28th ultimo the Treasury notified receipt of advices from the High Commissioner in London to the effect that the Union Government had been successful in getting the Union-Castle Mail Steamship Company to withdraw the surcharge imposed on freights to and from South Africa in so far as concerns shipments under the three agreements subsisting between the Company and the Government. These three agreements are:—(1) The Ocean Mail Contract, the commodity principally affected being fruit for export; (b) the Government Freight Contract, which applies to outward freight shipped by, on behalf of, or for the Government; (c) the Homeward Produce Contract, which applies to maize and other cereals, wattle bark, wool and skins. The Company has also agreed to refund any amounts paid in respect of surcharge under Agreements Nos. 1 and 3. Negotiations are still proceeding with a view to the reduction of the surcharge on merchants' freights.

* * * *

The German Loan.

Recently we were treated to what is described as the final announcement with regard to the recent German loan:—"The final result of the German War Loan is now 4,460,728,900m. (£223,036,445) — viz., Imperial Loan 3,121,001,300m. (£156,050,065), and Exchequer bonds 1,339,727,600m. (£66,986,380)." It must be obvious to every thinking man that these figures are absolute bunkum, says a correspondent of the *Financial News*. In the first place, no transaction can properly be described as a loan where there is compulsion to subscribe. The fact that everybody with money in the bank in Germany was compelled to subscribe 25 per cent. to the loan demonstrates at the outset that the transaction was not a loan at all, but blackmail on a large scale. The adoption of such a method indicates, in the first place, the profound German distrust of the whole transaction; in the second, the absolutely unscrupulous character of the German financiers engaged in the business, and, in the third place, the desperation of a position which renders such tactics necessary. Again, people who have sold goods to Germany have been informed that they will be paid in scrip of the loan. An acute correspondent pointed out the other day that this loan is, in effect, a sixth mortgage upon German assets, which are wasting at the rate of about £3,000,000 a day. To induce a man to sell goods on the pretence that you will pay him in cash, and then to give him sixth mortgage bonds, which are practically worthless, is commercial dishonesty at least—it is, in fact, flat theft, and nothing else. That being the case, what is to be said of the alleged success of a loan transaction which can only be carried out successfully by picking your neighbours' pockets? The alleged success is, in fact, all humbug. The loan was a dismal failure, foreshadowing a time when German scrip will be the off-scouring of the European markets.

The Tin Position.

According to the latest mail advices from London, the tin metal market seems to be in a very parlous condition. It is difficult for producers of tin oxide to realise. The smelting firms appear to evade making bids for tin concentrates. Dealing is entirely a matter of negotiation. The last business we heard of was done on the basis of £123 10s. per ton for metallic tin. This is the lowest quotation recorded since 1909, in which year the value of the metal dipped to precisely the same level. Since then it has touched £233 per ton. Few of the tin-producing companies can be earning any profit at all on the basis of the present price of the metal. The position of copper also continues to discourage operations in the shares of the companies producing that metal.

* * * *

Union Government and War Measures.

Upon the promulgation of the Public Welfare and Moratorium Act representations were made to the Minister of Railways that the Government might assist the financial position by (a) accelerating the scheme for advances on Union produce; (b) facilitating the export of maize; (c) extending its King's Enemy War Risk scheme so as to include shipments of wheat and flour from Canada and the United States of America. Action has since been taken in these matters. Copies of memorandum explaining the objects and scope of the Government Produce Scheme have been supplied to the Chamber of Commerce by the Treasury. The principal modifications of the original draft are as follows:—(a) The abandonment of the proposal to have only one Government Agent at each approved centre; (b) the exclusion from the scheme, for the time being at any rate, of skins and hides; (c) valuations of produce to be on the basis of average prices realised during the six months January to June, 1914; (d) advances on mohair to be 40 per cent. of value and on wool 50 per cent.; (e) the scheme has been extended so as to provide for advances being made on produce shipped from the Union. Restrictions of export of maize have been removed and the Admiralty is endeavouring to arrange for vessels to facilitate shipment. The Government has extended its scheme for war risk insurance so as to cover imports from Canada and United States of America. Applications are dealt with by the Joint Secretary of the Association of Chambers of Commerce at the office of the Chamber of Commerce.

* * * *

An Enquiry from Rhodesia.

The General Superintendent of a well-known Rhodesian mine writes to us as follows:—"We are putting up a small plant on this property for the production of pig lead, and the question has arisen as to whether the output could not be disposed of in South Africa. Can you give us any information on this subject, or put us in touch with any likely buyers?" Will any likely buyers communicate with this paper, when full particulars and address will be furnished?

* * * *

An Engineer's Tribute to Belgium.

"It has been impossible for men who have watched the splendid engineering progress of Belgium during the past decade or two to refrain from expletives of no superficial kind—expletives expressive of the deep emotions representing intermingling of anger and sympathy at the calamitous havoc wrought by the invader," says the *Electrical Review* in the course of a fine tribute to Belgium. "The works of Cockerill and Carels Fréres, the steel works achievements and the gas and oil engine building operations, the name of Greiner—these are but reminders of the Belgian industries which have for years marked out these progressive Allies of ours, industries which have now been laid low. There will not be an engineer in either hemisphere, unless he be a German, who will not have an emotion of sympathy for Adolphe Greiner and those of whom he is a type in this period of unparalleled catastrophe. May time decree that a grander, greater, still more progressive Belgium shall arise from the present ashes." Every engineer in South Africa will heartily endorse these eloquent words.

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The Zinc, Tin, and Mercury Markets.

Latest American advices regarding the mercury, zinc, and tin markets are as follows:—The primary market for quicksilver is San Francisco, California being the largest producer. The price is fixed in the open market, and, as quoted weekly, is that at which moderate quantities are sold. Buyers by the carload can usually obtain a slight reduction, and those wanting but a flask or two must expect to pay a slightly higher price. Advice from London states that the British Government has secured all supplies of quicksilver in England for war purposes. It is allowing a certain amount to be sent to some South African mines. Indications are that prices are likely to appreciate instead of declining. New York quotes are $75 per flask. In zinc a decline after the unnatural advance was to be expected. An increase of $10 per ton was recorded during a period of two weeks, this being the sharpest gain in the history of the local industry. The strength was purely speculative; future strength will doubtless be based upon something more substantial, and there seems little doubt that an ultimate advance may be looked for. Of tin, a shipment of 725 tons is due in New York next week, which surprised the trade. Tin-plate scrap is accumulating, as Germany used to absorb the most of it.

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The Consumers' Alliance Against Enemy Trade.

In a quiet and unobtrusive way the Consumers' Alliance on the Rand seems to be doing good work. The Alliance aims at excluding German and Austrian goods from the South African market, and obtains for members information on the following points:—(a) The source from which their tradesmen obtain their goods. (b) The nationality of the proprietors, managers, and employees of firms. (c) The nationality of local agents for British firms. (d) What German or Austrian firms are trading under English names; and by (a) Bringing to the notice of the Board of Trade for Great Britain the steps that are being taken, and inviting from them suggestions as to any other means by which it is possible for the consumer to co-operate with them in the capture of German and Austrian trade. (b) Encouraging in every possible way the purchase of local products. (c) Devising means to enable the man in the street to distinguish between the firms of friendly and hostile races. Two circulars that have been printed and are now being sent out should result in the Alliance making material strides in the attainment of their objects. The first circular is to members and runs as follows:—" Consumers' Alliance, P.O. Box 1216, Johannesburg.—Dear Sir,—I am instructed to ask whether you wish the Consumers' Alliance to make enquiries about any of the tradesmen with whom you deal. If so, please state clearly their names and addresses. All enquiries will be made in the name of the Alliance only, and a report will be sent to you when received—Yours faithfully, Frank Parnham, hon. sec. Hon. Sec, Consumers' Alliance, P.O. Box 1216, Johannesburg.—Please ascertain whether the following firms are German or Austrian, or employ German or Austrian subjects." The second circular reads thus: "Consumers' Alliance, P.O. Box 1216, Johannesburg.—Dear Sirs.—My Committee is requested by a member of the above Alliance to approach you with a view to ascertaining whether the proprietors, managers, or any of the employees of your firm are German or Austrian subjects. The object of the Alliance in writing to you is to obtain reliable information first hand and to place such information at the disposal of its members. Each member will then be in a position to judge for himself or herself whether to deal with your firm. My Committee will esteem it a favour if you will fill in and return to me the adjoining form. The information will be transmitted to members without comment.—Yours faithfully, Frank Parnham, hon. sec. Voluntary statement: Are the members, proprietors, managers, and employees of your firm, or any of them, German or Austrian subjects? Reply .... Signed .... Sworn before me at .... this .... day of .... 191... Justice of the Peace."

TOPICS OF THE WEEK.

BELGIAN MINING IN AFRICA.

It is fitting, now that Belgium, pluckiest, bravest and best of small states, lies bleeding beneath the iron heel of German militarism, to recall the fact that she has in the Congo a free and glorious heritage that may one day mean for her a new and greater Belgium in Africa. It is true that some of the Powers that guaranteed the Congo to Belgium are the same Powers that pledged the inviolability of the Mother Country, and have so flagrantly belied the trust. But the Belgian Congo will stand, nevertheless, for the victorious Allies can be trusted to see that justice is done equally to Belgium and her African possessions. Mining is, of course, the chief asset of those possessions. In less than twenty years the united operations of the Tanganyika Concessions, Limited, in the copper region of Northern Rhodesia and of the Union Minière du Haut Katanga in the Katanga region of the Belgian Congo have brought into being a mining industry of great dimensions. At Lubumbashi, two miles west of Elisabethville, in the very heart of the Belgian Congo, three furnaces are now treating the ores from the Star of the Congo mine and producing large quantities of copper per month. Four other furnaces will be erected during this and next year, and it is estimated that the copper output will be 12,000 tons for the current year, 25,000 tons for 1915, and about 40,000 tons for 1916. Removed some 2,300 miles from its southern base, the Upper Katanga region, over which the Tanganyika Company held the prospecting rights, lay unknown and undeveloped even so recently as the nineties. To-day railways have been built to it and through it, the Rhodesia-Katanga line being well beyond the Kambove mines, on its way to Bukama and the lakes, while the Congo as a whole is being linked to the coast and brought nearer Europe by means of the Benguella line, which makes the littoral at Lobito Bay on the west. More than that, a great copper belt—" the biggest in the world "—has been defined, mines have been opened, machinery has been transported to them and erected, furnaces have been built, coal has been located, problems of ore-treatment have been solved, and production on a commercial basis has been begun. The achievement falls in equal measure to Anglo-Belgian credit—to the credit, that is, of the Tanganyika Concessions, Limited, and the Union Minière du Haut Katanga, which have been partners in the hard work and to-day share the honours. More particularly, the honours fall to the credit of Mr. Robert Williams, of the former company, and M. Jean Jadot, chairman of the Belgian company, between whom this great business of practically fashioning a new country has gone forward bravely, despite many obstacles, and in the process Anglo-Belgian friendships have been cemented in South Central Africa. Funds have not always been easily found either for mines or railways. Brussels, London, and even Lisbon, however, have supplied the backing, in response to the appeals and arguments of Mr. Williams, who has raised some six and a half millions sterling to carry on the railway and mineral undertakings in Africa. But the Star of the Congo is one mine among many, the mineral wealth of the Katanga being widespread and varied. Up to August, 1913, no less than 499 mineral discoveries had been reported to the Katanga Special Committee, these including " every kind of mineral." Of these one-fourth are brought within reasonable distance of the main line by the railway to Kambove, recently opened, whilst the extension, which is being pushed on to Bukama, and the projected branch from near Ruwe, through Katenda and Huambo to Lobito Bay, will tap 50 per cent. of the remainder, so that the opening up of numerous mines is now only a matter of time. Of course, even these are but beginnings, though upon them Mr. Williams and M. Jadot and all those associated with them are to be complimented. Perhaps, in the light of the happenings of to-day these pioneers have builded better than they knew in laying so well and truly the foundations of a bigger Belgium in Africa.

GERMANY'S ECONOMIC ISOLATION.

In the absence of any signal success for the German arms either on land or sea, her economic position continues steadily to grow worse. Every day that goes by without relieving the pressure that threatens her on both sides renders more hopeless the outlook for that Empire and those portions of the German colonies still unconquered in South Africa. Mining men, for instance, can picture for themselves the plight of such properties as the Otavi Mines in German South-West, cut off at once from oversea supplies and from the market for the product. The diamond fields of that territory are perhaps in little worse case than had they occupied a less prominent position in the fighting area, since the market for all descriptions of diamonds is at a standstill. Imports of the stones into the United States, according to the latest available statistics, are less than one-tenth of the usual value in pre-war times. In German East Africa, similarly, all mining is understood to be at a standstill. With the coasts of both territories closely blockaded by British warships and neighbouring territories held by the British, Belgian or Portuguese, the economic position of the two great African protectorates of Germany is in miniature that of the Fatherland—bad and growing daily worse. In Germany, the best proof that the economic pressure of the war is becoming increasingly severe is the effort that are being made to conceal it. Yet it must be obvious to the least thinking that if Great Britain, with the seas open to it for supplies of all kinds and a large proportion of its population retained for industrial purposes, cannot escape feeling certain adverse effects, the position must be many times worse for a nation which enjoys neither of these advantages. In spite of the endeavours of the Government at Berlin to prevent the true facts of the case from becoming known, there is really ample evidence of an indirect character in all the European papers that the German Empire is being very hard hit by all that is implied through the lack of substantial success by its naval and military forces. No doubt Germany can for a time live on its internal stores, but when the period of hardship begins thus early it is clear that that time is not of very long duration. A meeting of the leading agricultural, commercial and financial interests of the country was held in Berlin the other day and a resolution was adopted declaring that all economic sacrifices then necessary would be accepted gladly, and that even further sacrifices would be cheerfully incurred until a result was obtained corresponding to the enormous cost of the war and making its repetition impossible. A tremendous lot can be read between the lines of such a resolution, and at the least it admits that a heavy economic burden is already being borne by every section of the community, and that the cost of hostilities is reaching appalling dimensions. Even in South Africa we have evidence that the industrial life of Germany has been throttled. Her agents and ambassadors of commerce here are either themselves interned as alien enemies and their businesses disrupted, or, in the case of Britishers, they have ceased all relations with their former employers. The sublime cocksureness of victory displayed by some of the heads of German firms is illustrated by many current stories of the pains and penalties which they have threatened, by cable through neutral agencies, to inflict upon Colonial customers who have repudiated pre-war orders. A very potent influence which may help to force Germany to a chastened and reasonable frame of mind is her cable isolation. Not many people are aware how very complete this is and how tremendous is the psychological effect of a deprivation of this kind in modern times. In an article in the current issue of *Electrical Engineering*, showing the extent to which the German Empire is cut off from all communication with the outside world, it is stated: "Germany has five submarine cables which land at Borkum; one goes to Brest, one to Vigo, one to Teneriffe, and two via the Azores to New York. All these have been cut since the war began. They all five pass through the English Channel, so that there has been no difficulty in cutting them, and it is impossible for Germany to restore them. Between Germany and England there are six cables, part owned by the German Government and part by the British Government; traffic on all these has, of course, been interrupted by us." No outlets are possible elsewhere, because the cables either pass through hostile countries or have to connect with systems belonging to British companies, so that messages can be censored, while code cables are not accepted. Literally, therefore, Germany is a "wireless" country so far as external communication is concerned, and even "wireless" operations are greatly restricted. Plainly the net is beginning to close in on the arch-enemy of the peace of the world.

THE ENGINEERING TRADE WAR.

British engineering and other industries cannot complain that they have not received the benefit of ample information from the various Imperial Government Departments concerned to help them in their campaign for the capture of German trade. The Commercial Intelligence Branch of the Board of Trade is issuing dozens of bulletins—from some of which we are printing extracts—dealing with possible foreign and colonial developments in a variety of trades; British Trade Commissions, Commercial Attachés, and Consular Officers have been sending sheaves of telegrams of advice as to opportunities and methods; and the Governments of friendly nations have in many cases shown themselves ready to help with sympathy and counsel. But to what extent all this effort is bearing fruit is not yet apparent. A number of orders which had been placed in Germany, or would have been placed but for the war, have been transferred to British firms, but temporary advantages of this kind are by no means the same thing as an organised and sustained assault on the markets hitherto held by the enemy. No doubt such an assault requires time for its proper organisation and development, but it is a little discouraging to observe that in regard to the electrical industry, in which of late years Germany has made great strides, largely to British disadvantage, one engineering correspondent of the *London Times*, who is well acquainted with British conditions declares that nothing to the purpose has yet been done, and that the splendid possibilities of the situation look much less likely to be realized than they did a month ago. We note that a Rand engineering correspondent of a London paper offers the following sound advice, which sums up much we have written in these columns:—"A great opportunity now presents itself, owing to the present war with Germany and Austria, for British firms to recover the electrical trade on the gold mines of Johannesburg and in South Africa generally. During the last ten years German firms have almost completely ousted British goods, as merchants have found themselves compelled to make arrangements with German import houses, in order to compete against the unfair competition of bounty-fed German competitors such as the A.E.G. (Allgemeine Elektricitäts Gesellschaft) and Siemens. The largest electrical power station and distribution system south of the Equator was, with the exception of the boilers, supplied and erected by the A.E.G. for the Victoria Falls and Transvaal Power Co., Ltd. The incandescent lamp trade is almost entirely in the hands of German and Austrian manufacturers, as well as the smallest installation requirements. Already a boycott by most of the mining groups and municipalities is being extended to German firms and goods, but the merchant is practically helpless, as most of his competitive lines are German or Austrian." In furtherance of this campaign to wake up our friends oversea to the possibilities of the trade now going a-begging we emphasise elsewhere the advice given by the British Trade Commissioner in South Africa, which is the result of a deep, practical and first-hand study of the market.

MINING COMPANY CHAIRMEN ON THE WAR AND REBELLION.

Notable Tributes to the Union Government—Knights Deep, E.R. Mining Estates, and Western Rand Estates Directors and the Crisis—Patriotic Sentiments—Faith and Complete Confidence—Effect on Native Labour.

Recent mining company meetings have evoked notable statements regarding the war in Europe and the trouble with a section of the people in this country.

Scottish Mashonaland Chairman Speaks Out.

At the recent Scottish Mashonaland Company meeting, the Chairman, Mr. Walter Forbes, said, *inter alia*:—" I consider it somewhat a waste of time for me to speculate on the future—at least till the Allied Armies have stamped out the ' cultured " bullies and blackmailers of Europe. When that occurs—and occur it assuredly will—we shall be in a better position to judge of its effect in the world of finance, but that the effect will be great and beneficial no one can possibly doubt."

E.R. Mining Estates Chairman is Hopeful.

In the course of his speech at the East Rand Mining Estates meeting, the Chairman, Mr. C. F. Rowsell, said:—" We are meeting at a time of one of the most severe crises through which the world has passed within the lifetime of any of us who are present here to-day; and it is of some interest from the point of view of this company to recognise the fact that, while the credit of the world has been shaken to its foundations and the intrinsic value of many high-class securities has appreciably deteriorated, the mines of the Rand, which are in the first rank, have suffered much less, if at all, during this great crisis; in fact, one may say that they have been able to proceed with their work uninterruptedly, to earn their normal dividends, and to distribute these dividends among their shareholders as though the world were not in a state of chaos. I do not think that this fact will be overlooked when we once more reach normal times, and there should be, in my opinion, a tendency on the part of investors to give more favourable attention to securities of this class than they have for some time past been in the habit of doing, because they will naturally remember the effect that the war has had upon foreign investments in general and also upon all investments which are based upon ordinary mercantile transactions. With the exception of a few favoured trades, the war has had, and must have, a very serious effect, and the contrast will, therefore, be very marked when we again enter upon times when the public will have to consider the investment of their funds."

Mines Present United Front.

Speaking at the annual meeting of the Knights Deep, Ltd., Mr. D. Christopherson briefly referred to the present crisis. He said that he need not again repeat to shareholders as to what steps were taken to ensure the output of gold being maintained during the continuance of the present unfortunate European war, as details had already been published in the Press and repeated at various meetings of shareholders. The arrangements made are working most smoothly and the supplies of stores and other necessary commodities essential to the continuance of operations have been coming forward with satisfactory regularity, and there was every reason to hope would continue to do so. On the mines, in every department, all differences of opinion on political and economic questions had been put aside for the time being, all parties having the one desire to help as much as possible to get over the present Imperial and local difficulties. Referring to a paragraph in the consulting engineer's report that if the improved native labour position is maintained and normal conditions of working prevail during the ensuing year, the mine should attain a monthly profit appreciably higher than the average for the past financial year, Mr. Christopherson said it was impossible at present to estimate to what extent the action of those who were to-day defying the Government's authority might affect the native labour supply, but General Botha and his Government had the entire confidence and support of the bulk of the population of the country in their endeavours to quickly suppress the attempts of a small dissatisfied minority to enforce their views by open rebellion.

A Western Rand Estates Tribute.

Mr. J. Waldie Peirson, presiding at the annual meeting of the Western Rand Estates, Ltd., referred to the recent industrial troubles and proceeding, said: Our year was only ended a very short time when the arbitrary brutality and insufferable conceit of one man plunged the whole world into a war, the result of which must be disastrous to the human race, to victor and vanquished alike for many years to come. The certainty that right will prevail engenders a sure and perfect confidence that a nation so careless of its undertakings, so callous of its promises and so cruel and barbarous in its methods, will be subdued and humbled. Though many thousand miles away from the actual seat of war, the treachery and guile of the nation now at war with civilisation and honour, has by its emissaries of evil endeavoured in this country to set brother against brother and to disturb and perhaps shatter that growing sense of union which meant lasting peace. No words of mine can express our gratitude and the thanks of all right minded people to General Botha and his splendid second in command, General Smuts, for the strong stand which has been made to quell the troubles of this land. May they long be permitted to preserve the Union of South Africa. We cannot but regret and pity those who are taking part in folly and dishonour, but we must applaud General Botha for the prompt and stern measures he is taking, which must result in the good of the great South African nation we love, and cement it in its proper place in the Empire of which we are so proud. Perish all enemies, rebels and traitors! May God preserve our King, our Empire and our Allies so that we with them may stand calm, resolute and determined to see that right is done and that justice may prevail.

New Kleinfontein.

The report of the directors for the quarter ended 30th September, 1914, shows, *inter alia*:—Total working costs, £131,828 17s. 2d., or 17s. 0·584d. per ton milled; net working profit, £68,999 6s. 6d., or 8s. 11·079d. per ton milled; total revenue, £200,828 3s. 8d., or £1 5s. 11·663d. per ton milled. No allowance has been made in the above statement for the Government Profits Tax, estimated at £5,221 5s. 6d., nor for interest amounting to £3,506 15s. 4d. Mine: Shaft sinking—Number of feet sunk, No. 1 shaft, 46 ft. 6 in. Development—Number of feet driven, risen, and sunk (excluding shafts), 5,634 ft. 9 in.; footage sampled, 3,280 ft. 0 in.; average mining width, 52·34 ins.; average assay value (mining basis), 6·85 dwts.; estimated tonnage of ore exposed by drives, etc. (mining basis), 127,766 tons. Ore treatment: Tonnage mined, including ore obtained from development faces, 190,672 tons.; less sorted out (18·82 per cent.), 35,884 tons; tons to mill, 154,788 tons; deduct added to ore in bins, 138 tons; ore milled, 154,650 tons. Capital expenditure: The expenditure for the quarter was as follows: Shaft sinking, £1,859 11s. 11d.; underground equipment, etc., £855 5s. 0d.; total, £2,714 16s. 11d. Ore reserves: The ore reserves at the end of the quarter on a mining basis were as follows:—Payable: 2,775,286 tons; mining width, 56·57 ins.; value, 6·01 dwts. Unpayable: 1,181,925 tons; mining width, 52·72 ins.; value 2·87 dwts.

It is stated in a cable from London that in order to avoid the necessity of forced realisations, the British Government has arranged with the Bank of England to make advances to certain classes of holders on the Stock Exchange, with the object of enabling them to continue loans till the end of the war. A detailed account of the scheme appeared in our last issue.

FAR EAST RAND DEVELOPMENTS.

Consistent Results Secured Justify Optimism—Geduld and Daggafontein Facts and Figures.

THE developments which have been taking place in the Far East neighbourhood show very consistent results. As the Chairman of the E.R.M.E. put it at the recent annual meeting, " we are entitled to consider the results secured by these properties as having the very closest bearing upon the future of the East Rand Mining Estates. I propose," he added, " briefly to refer to two properties which actually adjoin Grootvlei (upon which, as you will remember, our principal work has been carried out)—namely, the Geduld Proprietary Mines, Ltd., and the Daggafontein Gold Mining Company, Ltd. Both these companies are developing mines immediately adjoining our property, the Geduld being situated on the north-west boundary of Grootvlei and the Daggafontein upon our southern boundary.

GEDULD AND DAGGAFONTEIN DEVELOPMENTS.

" The Geduld Proprietary Mines, Ltd., had at the 31st December last developed ore reserves amounting to 1,757,000 tons, of an average value of 6·9 dwts. over 58 inches, and, in addition, had 106,000 tons of indicated ore. For the quarter ended 31st March, 1914, 1,245 feet of development work sampled gave the satisfactory result of 8·5 dwts. over 35·2 inches; while for the quarter ended 30th June last 1,375 feet of development showed 7·2 dwts. over 38·1 inches. These figures are, I think, thoroughly satisfactory as indicating the payable nature of the Geduld Proprietary Mines, and, as a matter of fact, that company is now earning profits from its mill at the rate of about £10,000 per month. The Chairman of the company at the last general meeting drew attention to the fact that at the third, or deepest, level they had driven north and south for a distance of 1,655 feet, the average value being 12·25 dwts. over 40·16 inches, adding that the reef in both the north and south faces was still up to that value. He also pointed out that the last 60 feet sunk in a winze between the workings of Nos. 2 and 3 shafts gave values of 16·3 dwts. over 48·4 inches.

SOUTHERN DEVELOPMENTS.

" Turning now to the Daggafontein Gold Mining Company, which is situated immediately to the south of our property, the shaft which was commenced at the end of 1910 has now struck the reef at a depth of about 3,570 ft. The message from Johannesburg announcing this about the middle of last month also contains the information that ' Assays have been taken all round the shaft and show the value to be 8 dwts. over a stoping width of 40 ins.' This, again, is extremely satisfactory and promises well for the future of our company. Before I referred to these recent developments I pointed out that I thought the investing public would be impressed with the solidity of Rand mining investments during this war period; and where it will, I think, mostly affect our company is that it will greatly facilitate our efforts in securing the undoubtedly large working capital which will be required to bring it to a producing and profit-earning stage. Personally, I am inclined to think that when normal times return we shall again see active markets in Kaffir shares, and it will be in the interests of the world, and particularly in the interests of this country, that great gold-bearing areas, such as that which belongs to us, should be placed in a position to produce gold to take the place of those mines which will in the long run cease to be productive."

LIABILITY FOR MINING UNDERNEATH RAILWAY.

Important Decision in Case, S.A.R. v. Simmer and Jack.

IN the Local Division of the Supreme Court, judgment was given by Mr. Justice Bristowe this week in the action in which the Union Railways sued the Simmer and Jack Proprietary Mines, Ltd., for a decree to determine the liability of the litigant parties for the instability of certain portions of the railway ground in the vicinity of the mine, an instability, it was alleged, which was caused by excavation. The amount involved was not at issue. The respective liability was to be determined. In the course of his judgment, the Judge said that a declaration was claimed that the defendants were liable to pay the expense of supporting artificially, in accordance with a scheme framed by the Government Mining Engineer, certain areas on the railway (jeopardised, it was alleged, as to stability by the excavations made by the Simmer and Jack Proprietary Mines, Ltd). The claim, his Lordship said, was based on the common law, right of support to which the railway was alleged to be entitled for all land lying between the existing railway fences as defined in the plans before the Judge. The plaintiffs alleged that the defendants' excavations had caused imminent danger of subsidence, and that the scheme to which his Lordship had referred was reasonable and necessary for the protection of the surface of the railway. After tracing the details of this scheme, the learned Judge said that the defendant company had always repudiated liability to fill up the excavations, but they consented to do the work if the question as to who should bear the expense was reserved for the decision of the Court. The work was commenced, and had continued steadily since. It was not disputed that two years more would be required to complete it. The questions for decision were (1) whether the plaintiffs were entitled to support for certain strips of land exclusive of the staff quarters' area. It was admitted that if no right of support were claimed for those strips, his Lordship said, then on the principle adopted in the Government scheme the limits of support would be certain lines defined on the plan on the north and south. (2) The second question for decision was whether the plaintiffs were entitled to any and what adjacent support for land between the green lines on the plan; (3) whether there had been such interference with the plaintiffs' rights as to give rise to a common law right of action; (4) whether any right of action could be based on the defendants' non-compliance with the requisition of July, 1911; (5) whether the excavations between the 16th and 19th levels were authorised by the letter of July 18, 1905. After discussing the plans before him at some length, his Lordship said that he did not see how any argument could be drawn from those pieces of land as to the general width of the railway before the war. He came to the conclusion that the Besluit of 1892, even if it affected this part of the line at all, only created a power of expropriation which was never exercised before the war; and as it was not suggested that there had been expropriation since the war, it seemed to him that the title to the outlying strips of land had been shown, except the agreement entered into after the war with the defendant company, from which the right of support was expressly excluded. The plaintiffs, therefore, had failed to establish that they had any right of support in respect of the outlying strips. The next enquiry of the Court was as to whether the defendants had infringed the right of support to which they were entitled, or had they infringed it to such an extent as to create a cause of action. This matter depended from the question of a possible subsidence, and upon this there was a considerable conflict of learned testimony, towards which the Court could only maintain respectful silence, except to say that so far as his Lordship could form an opinion, the weight of evidence was against the plaintiff. Professor Lawn's evidence had seemed extremely convincing. It was doubtful whether even if unreservedly accepted, the plaintiff's witnesses proved that a subsidence was imminent. He doubted whether it was sufficient to say that the excavations would fall in eventually; and the evidence should establish that they were likely to fall in soon. The plaintiffs had relied strongly on the admitted indications of crushing in the workings at and below the 15th level, but those lay at a depth of from 650 feet to 824 feet; and Professor Lawn expressed a confident opinion that cavings at that depth were not likely to reach the surface. All his Lordship could say was that if he was right in thinking that the plaintiffs must establish that a subsidence was imminent, then he did not think that they had succeeded in doing so. As far as regarded the requisition, his Lordship found that the plaintiffs had failed to establish their case, not only as regarded the areas excavated before, but also as regarded those excavated since 1911. His Lordship found that the plaintiffs succeeded "as regards the pink areas between the green lines at the 16th and 19th levels," and that "there will be a declaration that the defendants must bear the cost of filling in those areas. As regards the rest of the case the plaintiffs fail. I do not decide that they may not be able to establish a cause of action hereafter, but for the reasons which I have given they have not satisfied me that they have one now."

UNION GEOLOGICAL SURVEY: ANOTHER YEAR'S WORK.

Report by Mr. H. Kynaston, Director—Distribution of the Field-Work—Summary of Results—Good Progress Made—Further Rand Conclusions Deferred.

DURING the year 1913 good progress has been made with the work of the Geological Survey in the Transvaal, Natal and Cape Provinces. The work in the Transvaal has been continued by the Director in the western portion of the Province, and by Mr. A. L. Hall in the eastern portion. On the Witwatersrand no actual mapping was undertaken during the year, Dr. Mellor having been absent on vacation leave, as well as having attended the meeting of the International Geological Congress in Canada as a delegate of the Mines Department. After his return from leave Dr. Mellor was occupied in making a commencement of the survey of the East Rand and in the preparation for the printer of the maps of the Central and Western Witwatersrand, which it is expected will be ready for publication in the course of the present year. In the Western Transvaal, the Director carried on the continuation of the survey of the Northern Rustenburg District as far as the junction of the Marico and the Crocodile Rivers, while in the Eastern Transvaal Mr. A. L. Hall was occupied mostly in the country south and south-west of Barberton, and also completed some traverses in North Western Swaziland, including a visit to the tin workings in the neighbourhood of Embabaan and Forbes Reef. During the latter part of the field-season Mr. Hall moved on to the higher ground in the Carolina District, south of the Delagoa Bay Railway, and completed the mapping of the south-eastern corner of the Belfast Sheet. In the South Eastern Transvaal and Natal Dr. W. A. Humphrey continued the mapping of the area between the southern border of Swaziland and the Umkuzi River during the winter months, and during the latter part of the season was occupied in the survey of the country lying mainly south-west of Piet Retief, and completed the western portion of the Piet Retief Sheet. In October Dr. Humphrey joined Dr. A. L. du Toit in East Griqualand, and in company with him carried out a traverse across a portion of the Karroo System from the Lower Beaufort through the Upper Beaufort and Molteno Beds to the Cave Sandstone of the Drakensberg. The object of this traverse was to enable Dr. Humphrey to become acquainted with the sub-divisions of the Karroo System that have now been followed by the Cape geologists up to the borders of Southern Natal. In the Cape Province the Assistant Director, Dr. A. W. Rogers, was occupied for a little over five months in a survey of the north-western portion of Namaqualand. On 20th September he left for Europe for six months' vacation leave. Dr. A. L. du Toit completed the mapping of portion of East Griqualand and of the Alfred County in Natal, joining up the work done by W. Anderson in 1905 for the Natal Government with that completed by E. L. Schwarz for the Geological Commission in 1902. During October the Director was absent in Natal and Zululand, where he undertook various traverses in company with the Inspector of Mines for Natal and the Mining Commissioner for Zululand, the object of which was to gather information bearing upon the future methods of mapping to be adopted in the country traversed, to collect data that would assist in the correlation of the various formations with those of other parts of the Union, and to inspect various mineral deposits. During the early part of November he made a traverse of the older rocks exposed near the junction of the Pongola and Pivaans Rivers, in the Vryheid District, in company with Dr. Humphrey.

SUMMARY OF FIELD-WORK.

(1) *Witwatersrand.*—As already stated, a commencement was made by Dr. E. T. Mellor towards the end of the year with the detailed mapping of the Eastern Witwatersrand, and in this connection a plan was compiled showing the location of the principal boreholes in that area and the results obtained therefrom. The field-work was largely of the nature of preliminary traverses with a view to connecting up the East Rand with the area already surveyed to the west, and in arranging the future course of the work eastward. On account of the preliminary nature of the work, therefore, an account of it is deferred until it can be incorporated with a full report dealing with the whole Eastern Rand.

(2) *Rustenburg District.*—In the northern portion of this district the Director completed an area of 850 square miles, including 70 miles of geological lines. This forms the northerly continuation of the country surveyed during 1911 and 1912 lying between the Crocodile and Marico Rivers, the mapping being carried as far as the junction of these two streams. This area is for the most part flat and covered with bush, outcrops of rock being scarce; in fact, being only seen near the banks of the rivers and in two small isolated kopjes. The general formation is that of the Older Granite, with associated gneisses and hornblende-schists, the two latter being frequently interbanded with one another over considerable distances. An interesting occurrence of ultrabasic rock occurs at the Koornkopjes, about nine miles west of Oolies Drift, on the Crocodile River. It consists essentially of a medium-grained aggregate of olivine and enstatite, and may be classed as peridotite. The kopje forms a low ridge, trending approximately east and west, and rises abruptly from a plain of black soil or "turf," beneath which it is probable that a much larger extent of basic rock is hidden. The granite of the Marico Valley for several miles below Laatste Poort was found to be cut by dykes, with a general north-westerly and south-easterly trend, which are obviously a continuation of the belt of intrusions noticed in the Dolomite area further south-east, and associated with the syenitic intrusions of the Pilandsberg. These dyke-rocks vary from syenite and augite-syenite to dolerite. The mapping also included a portion of the range of hills running north-east from Vliegepoort and consisting of Ventersdorp volcanic rocks and Black Reef Quartzite. A brief examination was also made of the prospecting works for diamonds on the farms Vaalboschlaagte and Houwater in the Pilandsberg Range. Here three small occurrences of Kimberlite breccia had been opened up, apparently filling fissures in the Pilandsberg volcanic rocks. The Houwater occurrence and one of those on Vaalboschlaagte are both very micaceous in character, show numberous and fairly large garnets and ilmenite ("carbon"), and contain nodules of garnet-pyroxene rock. At the bottom of one of the shafts, at that time down to a depth of 90 feet, the material was full of small calcite veins and resembled a micaceous variety of blue-ground. The third occurrence showed practically no mica, but gave a "deposit" very rich in large "carbons" and garnets. The results of washing proved disappointing, and later the workings were abandoned.

(3) *Carolina and Barberton Districts and Portion of Swaziland.*—During the winter months Mr. A. L. Hall made a traverse of the country from Bethal eastwards by way of Lake Chrissie to Oshoek, Steynsdorp and Embabaan, thence via Carolina to Barberton. The object of the journey was to obtain as wide a preliminary knowledge as possible of the general physical and geological conditions of the ranges of the older rocks in the neighbourhood of Barberton and in North Western Swaziland. This area is exceedingly complex geologically and also presents considerable physical obstacles to systematic mapping, so that an extensive geographical acquaintance with it is essential. In the course of this trip important information was obtained in connection with the relationship between the Swaziland System and the Older Granite at Forbes Reef (Swaziland), Steynsdorp and near Barberton. The succession and principal characters were also studied of the leading members of the Moodies Series in the Ingwenya Range, east of Oshoek and south of Barberton, and an examination was made of the tin deposits of Forbes Reef and Embabaan. These latter have been described by Mr. Hall in a paper read before the Geological Society of South Africa, entitled "Notes on the Tin Deposits of Embabaan and Forbes Reef in Swaziland." As is well known, the deposits of Embabaan are essentially alluvial in character, and the minerals mozanite, euxenite and corundum are associated with the cassiterite, and have no doubt been derived from the same source, namely, the pegmatite veins in the granite. The occurrences at Forbes Reef are somewhat remarkable, being partly in the granite and partly in the form of large well-defined crystals in the adjacent schists. In association with the latter, Mr. Hall points out that ruby or resin tin is common, but that none of the characteristic accessory minerals, such as are found at Embabaan, are known at Forbes Reef. The extensive area covered by the Barberton belt renders a detailed examination of parts of North-Western Swaziland necessary, in order to work out the geological structure and history of this area, and owing to its complexity and mountainous character, a detailed survey will probably occupy a considerable time. During the latter portion of the field-season Mr. Hall's work was confined to the Carolina District, south of the Delagoa Bay Railway, and mainly south-east of Machadodorp, where he completed 838 square miles, including 1,150 miles of geological boundary lines. The mapping of this area completed the Belfast Sheet, and it is interesting to note that the mapping of the Transvaal System in the eastern portion of the Province, commenced in 1905, is also completed, the various divisions of the system having now been followed continuously along the escarpments which constitute the "Drakensberg" of the Transvaal, until they disappear on the south in the neighbourhood of Carolina beneath the Karroo rocks of the high veld. The examination of the general and economic geology of the whole of the Kantoor Plateau was completed as far south at Tafelkop, forming a useful commencement of the mapping of the De Kaap Valley and the Barberton area, which will be continued during the present year. An examination was also made by Mr. Hall of the asbestos occurrences, situated and formerly worked on the farm Diepgezet, east of Carolina, and also of an occurrence of a complex gold-silver-copper ore on the farm Gevonden, in the Komati River Valley.

(To be continued.)

Mining Near Kiaochow.

Coal mining is among the important industries in the German zone in China, now besieged by the British and Japanese. It was reported in the *Weekly China Tribune* that valuable iron ore had been found in the Kiaochow district. The paper adds: Recent investigations have shown that samples contain 65 per cent. iron, 0·24 per cent. manganese, 0·03 per cent. phosphorous, and 0·08 per cent. sulphur, while the veins of ore are 25 to 50 yards in thickness. It is estimated that there are about one hundred million tons of ore in the district. Its value is still further increased by the fact that there is a plentiful supply of coal in the vicinity. New ironworks will be erected at Tsangkau, and will have two blast furnaces, each with an output of 150 tons per day. The capital to be invested will amount to about $2,500,000 gold.

HOW TO CAPTURE GERMAN TRADE IN SOUTH AFRICA.

Points for Manufacturers—Six Essentials of Success in this Country—Official Advice Amplified and Explained.

The British Trade Commissioner in South Africa emphasises the importance of attention being paid to the following details of trade organisation by British manufacturers desirous of taking advantage of the extended possibilities of the South African market as a field for their enterprise:—(1) *The need for local representation.* (2) *the enormous advantages that, as a rule, follow the visit of a principal to South Africa for the purpose of becoming intimately acquainted with local conditions of trade.* (3) *The necessity for meeting foreign competition by the supply of articles identical with those being exploited by our foreign competitors.* (4) *The adoption of an overhead charge in all cases where South African trade custom makes it necessary.* (5) *The study of packing, in order that handling, both on the part of the wholesaler and retailer, may be reduced to a minimum of labour with a maximum of convenience.* (6) *Sympathetic and generous treatment towards the local representative, and a strong endeavour to adjust the exporter's point of view to that of the South African merchant.*

No. 1.—THE NEED FOR LOCAL REPRESENTATION.

IN his now famous Engineering Trades Report, Mr. Ben H. Morgan wrote as follows on this all-important subject:—

It is difficult to advise as to the most advantageous way in which manufacturers should push respective businesses, as special considerations will naturally affect each case. In most of the smaller classes of goods it does not pay to have a special representative, and in some cases it is dangerous to give sole agencies. It depends entirely upon the class of goods to be dealt in. In agricultural machinery, for instance, a large business can only be done through the merchants situate principally in the coast towns. They control large up-country stores, besides having travellers continually scouring the country for orders from small retailers. To attempt to do a paying business in this line outside of the merchant would be to court failure. In agricultural and, generally speaking, the smaller classes of machinery I recommend dealing with merchants. Send a first-class man (who thoroughly understands every detail of the goods he is selling) to sell to the merchants, and, having covered the ground, let him afterwards call on retail storekeepers inland, not to book orders, but to "talk" his goods and endeavour to assist the merchant by creating a demand for them.

IMPORTANCE OF SUPPLYING THE RIGHT ARTICLE.

The essence of success lies in supplying the right article for the market, and when goods are definitely ordered the manufacturer should be most scrupulous in strictly adhering to the terms of the order as regards quality, weight and size. The ordinary South African merchant and storekeeper have hundreds of different articles in their stocks, and though, as a rule, such stocks are splendidly organised, it is obviously impossible for them to take any particular trouble in selling any particular item; goods must therefore largely sell themselves, hence the great importance of supplying the right article at the right price for this market.

APPOINT OWN REPRESENTATIVES FOR CERTAIN LINES.

In the larger machinery trades the situation is different. Tenders are invited by the big financial or railway or tramway concerns, by mine managers and others, and prices are sent in by merchants holding agencies for firms, sole agents and direct representatives. It is for the manufacturer to consider which medium of sale best advances his interests. For manufactures in a large way, and having suitable goods for the market, I consider the best plan is to have their own representatives, office equipment, and warehouses if necessary. This means some outlay of capital, but many an order is lost to British firms through the merchant endeavouring to make an unreasonably big profit. It must be firmly understood that on the Rand, with its cosmopolitan engineers, etc., the manufacturer makes a grievous error when he thinks he can send a junior representative who has only to state the name of his principal when the ripe plums in the shaps of orders will be thrown at him.

SOLE AGENCIES.

As I have stated, the utmost discretion must be exercised in giving out sole agencies. For working certain classes of business it is necessary to do this, but the manufacturer should satisfy himself that the merchant has the necessary travellers covering the district and that he will make some special effort to find a wide market.

PREVENT UNDUE COMPETITION AND OVERLAPPING.

Where large orders are obtained from a merchant who has not been given a sole agency, the greatest care should be taken to prevent overlapping and undue competition by indiscriminate selling to other merchants in the same district. Such selling often leads to the gradual dropping of the particular goods by all concerned. Suppose, for instance, an English traveller goes out and prevails on a merchant to take a supply of his goods and then straightway persuades other local merchants to do the same. The traveller then goes up country practically over the ground covered by the merchants and gets a lot more orders, and returns home thinking he has built up a fine connection. But no sooner do the merchants find out that all their competitors and customers have laid in stocks as well as themselves then cutting commences, with the result mentioned above. I learn that German houses are most careful in their dealing to prevent overlapping, and success is attending their efforts in the introduction of agricultural machinery, especially ploughs.

THE COMMISSION HOUSE.

In regard to the Johannesburg machinery trade the Germans are following the American commission house plan to push their manufactures. A large concern of this kind has just commenced operations there under the name of the German Manufacturers' Corporation for South African Trade. American commission houses usually operate in this way. They secure sole South African agencies for, say, twenty or thirty first-class firms in different lines of business, and in their interests for a nominal commission send travellers all over the markets booking orders. They work chiefly on a letter of credit basis, at any rate for large lines, and in some few cases on ninety days' sight drafts (chiefly the two first). An essential part of their system of business is to issue monthly price-lists and trade reports. These lists contain detailed information, latest prices, weights and illustrations of the goods of the firms represented, with the terms on which business can be done, such firms paying for their respective advertisements in these lists. This system has been found to be most effective, and largely accounts for the headway America is making in South African trade. The American traveller representing one of these houses is able to quote close prices for over a hundred lines of goods, whereas the English traveller can do so only for a few. It may be that a traveller who concentrates his attention on a few articles may succeed better in those lines than the man who distributes his energy over a large number, but the commission house system enables manufacturers of specialities to quickly and cheaply introduce them to the retailer.

CORRESPONDENCE AND DISCUSSION.

Voluntary Civilian Training Association.

To the Editor, *South African Mining Journal.*

Sir,—Judging from the variety of letters appearing in the Press, I think the time has arrived when the aims and objects of the Association should be clearly defined. For your information I enclose a copy of these aims and objects, which were drawn up on the 10th of September. For your further information I should like to inform your readers that at Benoni we have 63 mounted men on active service and 70 doing special police work. At Germiston we have 58 mounted, 272 doing special police duty, 19 motor cars, and 25 motor cyclists. From Roodepoort to Maraisburg we have taken over the police duty entirely. There are 30 mounted men there, 10 motor cars and 18 motor cyclists. It is only right to say we are working in perfect harmony with the various magistrates of the districts. I also enclose Circulars Nos. 11 and 12, which have been sent to the organizers. From all this information I leave you to judge whether we are fulfilling the aims and objects as originally drawn up.—Yours, etc.,

H. H. FISHER,
Secretary.

P.O. Box 3012, Johannesburg,
30th October, 1914,

THE RAND AS A MARKET FOR ELECTRICITY.

Striking Statistics of Power Generated—Description of Producers—Plants and the Names of Their Makers—Figures that Reflect Growth of Electrical Power Supply.

The following figures, recently compiled and published by the S.A. Institute of Electrical Engineers, and presented to the S.A. Association for the Advancement of Science, are interesting at this juncture:—

Electricity Generated on the Rand.

Name of Power Supply Co., Mining Co., or Municipality owning Generating Plant.	Generating Station Plant.						Total Capacity of Station.	
	Name of Generating Station.	No. of Sets.	Makers' Rating per Set. K.W.	Makers' Rating per Set. K.V.A.	Maker's Name.	Type of Plant.	K.W.	K.V.A.
The Victoria Falls and Transvaal Power Co., Ltd., and	Brakpan	2	3,000	4,000	A.E.G.	Turbine 3-phase	6,000	8,000
	Simmer Pan	6	3,000	4,000	A.E.G.	,, ,,		
		2	11,000	15,000	A.E.G.	,, ,,	40,000	54,000
The Rand Mines Power Supply Co., Ltd.	Rosherville	5	9,600	12,000	A.E.G.	,, ,,	48,000	60,000
	Vereeniging	2	9,600	12,000	A.E.G.	,, ,,		
		2	12,000	18,000	A.E.G.	,, ,,	43,200	60,000
	Total	19					137,200	182,000
Randfontein Estates Gold Mining Co., Witwatersrand, Ltd.	Randfontein Estates Power Station	3	6,000		1 Westinghouse 2 Parsons	Turbine 3-phase	26,000	--
		3	2,000		Parsons	,, ,,		
		2	1,000		Parsons	,, ,,		
East Rand Proprietary Mines, Ltd.	E.R.P.M. Central Power Station, Angelo Section	3	1,150	1,300	Bellis & Morcom and G.E.C.	Reciprocating	19,950	25,900
		1	1,500	2,000	Parsons	Turbine 3-phase		
		1	3,000	4,000	Willans and	,, ,,		
		1	6,000	8,000	Dick Kerr	,, ,,		
		1	6,600	8,000	A.E.G.	,, ,,		
The Municipality of Johannesburg.	Municipal Power Station, Johannesburg	3	3,000	3,750	Bellis & Morcom	Turbine 2-phase	13,250	—
		1	1,000	1,250	,,	Recip'g ,,		
		2	250	312·5	Allen	,, ,,		
		2	1,000		Bellis & Morcom	Reciprocating Direct Current Plant.		
		2	500		,,			
		1	250		Allen			
Kleinfontein Power Association	Kleinfontein Power Association, Central Power Station.	3	2,000	2,475	Parsons	Turbine	6,000	7,425
The Langlaagte Estate and Gold Mining Co., Ltd.	Langlaagte Estate Power Station	1	85	100	Bruce-Peebles	Reciprocating	2,085	—
		3	400		A.E.G.	,,		
		1	500		Siemens	,,		
		2	150		A.E.G.	,,		
A. Goerz & Co., Ltd.	Geduld Proprietary Mines	1	800	1,000	Siemens	Exhaust Steam Turbo	800	1,000
	Princess Estate	1		170	,,	Steam-driven	390	394
		1		64	,,	,,		
		1		160	,,	,,		
S. Neumann & Co., Ltd.	Witwatersrand Deep,	1	1,000	—	Parsons	Turbine	2,500	2,250
		1	750	—	Brit. W'house	Reciprocating		
		1	500	—	Gen. Electric	Curtis Turbine		
	Cons. Main Reef	1	1,000	—	Parsons	Turbine	1,500	—
		2	250	—	Gen. Electric	Rope drive		
	Wolhuter G.M. Co.	2	400	—	E.C.C. & B.G.E.	Rope-driven and Recip.	800	—
	Knight Central	1	750	—	A.E.G.	Rope-driven	750	—
General Mining & Finance Corporation, Ltd.	Aurora West	1	160	—	Mather & Platt	Direct coupled	360	—
		1	100	—	Do.	Do.		
		1	100	—	E.C.C.	Rope-driven		
	Van Ryn	2	500	—	Brit. W'house	Reciprocating	1,375	—
		3	125	—	Mather & Platt	Rope-driven		
Krugersdorp Municipality	Power Station	2	225	—	Siemens	Reciprocating	450	—

In view of the statements which have appeared in the Press to the effect that the destruction wrought by German shells upon fortresses in Belgium points to their possessing a secret explosive much more powerful than any known to the other European armies, a correspondent of a daily contemporary gives the warning that such rumours should be taken with a great deal of reserve. It became known some twelve months ago that Germany had adopted trinitrotoluene in the navy for high-explosive shells, torpedoes, and sea mines, and in all probability it is this substance that has caused consternation in some quarters. As an explosive, trinitrotoluene is eminently safe to handle, and needs to be detonated by mercuric fulminate, the impact of a rifle bullet even being insufficient to explode it. A shell or mine loaded with it bursts into larger fragments than when picric acid is the explosive, and although wet guncotton is more powerful if exploded in close proximity to the target, the effect produced by trinitrotoluene is much greater when the explosion takes place some distance. Whereas picric acid readily forms metallic picrates which are dangerous to handle, trinitrotoluene does not react with metals, and can be manipulated safely even when hot, as it burns slowly without exploding.

DEVELOPING THE EMPIRE'S RESOURCES.

Imperial Institute Widening the Scope of Its Work—Valuable Technical Reports.

THE work of the Imperial Institute, already an established factor in the development of the interests and resources of the British Empire, is being further extended in directions likely to be of immense value to a country with the problems facing South Africa. It has well be said that, even at a time like the present, when all material values are in the melting pot, "civilisation must not only be defended, it must be carried on." The following dispatch from the Secretary of State for the Colonies to the various High Commissioners of the Empire is published, and should be commended to all concerned in developing the resources of the Union:—

Downing Street,
11th September, 1914.

Sir,—I have the honour to inform you that my attention has been directed to the yearly increasing demands which are being made on the Imperial Institute by private individuals and firms for reports on technical subjects, and especially on the composition and value of raw materials.

2. In the past it has generally been impossible to accede to such requests for investigations from private individuals and firms owing to the pressure of other work. At the same time, the conduct of such investigations seems to me to be a legitimate function of the Institute, and I have been given to understand that the demand for such reports would be considerably extended if it were known throughout His Majesty's Possessions that the Institute was prepared to undertake for individuals special reports of the kind indicated in paragraph 8 of the Earl of Elgin's Circular Dispatch of the 31st of July, 1906.

3. The Institute, however, is now so completely occupied with the scientific, technical, and commercial researches demanded by the agricultural, mines, and other technical departments of the Governments of those parts of His Majesty's Dominions which contribute to its funds that it is impossible to undertake investigations on any considerable scale for private individuals and firms without adding to the technical staff, and therefore to the general expenses, of the Institute. But, having decided to meet what I believe to be a growing demand for such work, I am authorising the Imperial Institute to undertake in future for an appropriate fee researches, investigations, analyses, etc., required by private individuals and firms, either in this country or any of His Majesty's oversea dominions.

4. It will be left to the authorities of the Institute to decide in the case of each application whether or no the request for researches, etc., is one with which the Imperial Institute can properly comply.

5. Any reports which may be supplied under this arrangement will become the property of those who pay for them, and will not be communicated either by the Imperial Institute or by any Government to other persons, or published without the consent of those concerned.

6. As it is undesirable that the Imperial Institute should compete with the professional expert, I propose that only special investigations, etc., on subjects of a technical character with which the Imperial Institute is exceptionally qualified to deal, especially those relating to the production and utilisation of materials which occur in the British Empire, or which might be introduced into British countries, and are considered likely to be of value to British commerce or trade.

7. It may be useful if I refer to some of the more important matters with which the Imperial Institute is in a special position to deal: (a) Investigations as to the value of new or little known raw materials for commercial purposes; (b) Chemical analyses, assays, and valuations of raw materials, such as fibres, rubbers, oil-seeds, waxes, foodstuffs, tanning materials, essential and fixed oils, gums, resins, drugs, tobaccos, soils, minerals, ores, waters, fuels, etc.; (c) The technical testing of rubber, timbers, cotton, fibres, cements, and other materials; (d) Identifications of vegetable and mineral substances.

8. I am informed that the managing committee are not prepared at present to suggest any actual scale of fees which could meet the variety of cases which are likely to occur. The fee must be arranged between the Institute and the individuals or firms who require investigations to be made. The matter will be in the hands of the director, who will from time to time report to the managing committee the fee proposed in any special case in which this cannot be determined by ordinary practice.

9. I believe that the adoption of the plan I have indicated will increase the usefulness of the Imperial Institute to the manufacturing and industrial communities of all countries of the Empire; and, as it will doubtless be of importance to the residents of the territories under your government, I shall be glad if you will take steps to make the arrangement I have sanctioned widely known, either by publishing this dispatch in whole or part in the *Official Gazette* or in such other way as may seem to you to be most effective.

It is unlikely that any immediate response to this advance is likely, but the conclusion of the war should see a renewal of activity in the development and exploitation of Union resources, and in the pioneer part of the work the scientific activities of the Institute should be of great value.

SOUTH AFRICAN OIL POSSIBILITIES AND THE GEOLOGICAL SURVEY.

Mr. Cunningham Craig's Report and the Work of the Union Survey.

IN his introduction to the annual report of the Geological Survey of the Union for the year ended the 31st December, 1913, the Secretary for Mines, Mr. Warington Smyth, writes *inter alia*:—

Early in June, Mr. E. H. Cunningham Craig, late of H.M. Geological Survey of Scotland, who had been appointed by the Union Government to inquire into and report upon the prospects of obtaining supplies of oil within the Union, commenced a tour of the several Provinces. Mr. Craig's report, which contains an account of his geological observations, inspections and conclusions, has already been published, so that it is unnecessary to say anything further with regard to his visit, except as it affected or is likely to affect the work of the Geological Survey. During the greater part of his tour of the Cape Province Mr. Craig was accompanied by Dr. Du Toit, and in the Transvaal by the Inspector of Mines, Pretoria, and the Director, and in Natal by the Inspector of Mines for Natal and for part of the time also by the Director. In the Cape Province and Orange Free State the ground traversed by Mr. Craig was already known geologically, either from the results of detailed mapping or inspection, and his conclusions have in the main confirmed the observations already made by the geologists of the late Geological Commission of the Cape Colony.* In the Transvaal and Natal, Mr. Craig's inspections were mainly confined to occurrences of oil-shales and allied rocks in areas which have so far not been mapped or studied in detail by the Geological Survey, and Mr. Craig's observations thereon and the opportunities afforded by his visit for inspection of these areas by officers of the Mines Department should prove to be of considerable interest and value. In the Ermelo, Wakkerstroom and Utrecht Districts the oil-shale occurrences examined by Mr. Craig are found in the lower portion of the Coal-measure Series and closely associated with the coal horizon. In the Ermelo District the coal and associated shales are several hundred feet higher above sea-level than in the latter districts. It seems probable, however, that the geological horizon is essentially the same. In fact, it is well known that as one proceeds to the east or south-east from the Transvaal high veld into the area about Amsterdam and Piet Retief, or into Natal, the coal horizon appears at successively lower and lower levels, while the formation as a whole, with a few local exceptions, remains practically horizontal. This phenomenon may, to a limited extent, be accounted for in some cases by faulting, but it is more probably the result of the original conditions under which this portion of the Karroo System was deposited; the gradual subsidence of the old dissected land surface bringing different levels successively under the conditions suitable for the formation of coal seams, culminating in the gradual submergence of the plateau of older rocks, which now underlies the high veld of the Eastern and South-Eastern Transvaal. The mapping, however, of all the area bordering the high veld will, no doubt, throw considerable light on this question, as well as on that of the extent of the coal seams and oil-shales. In the more southerly portion of Natal the shales inspected by Mr. Craig in the Hlatimbe Valley of the Impendhle District are at a considerably higher geological horizon than those above referred to, probably about the horizon of the Molteno Beds. This horizon could be easily mapped out on a good topographical map of convenient scale, and it is probable that the survey of Southern Natal will reach this area before very long. For a description of the shales and their economic possibilities, reference should be made to Mr. Cunningham Craig's report.

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*See Rogers and Du Toit, "Geology of Cape Colony," pp. 283, etc.

Rhodesian Section.

LATEST MINING NEWS.

Chamber of Mines' Report—Scottish Mashonaland—Chartered Company and Rhodesia

The Alabama Syndicate has taken over the Knock Out claims in the Gatooma district. A Tremain mill has been erected on the property and crushing operations will commence on November 1st.

* * * *

In spite of the depressed times and the falling rate of production in various other occupations, the output of gold in the Gatooma district for the month of September shows a satisfactory increase over that of the previous month. In August the value of gold rescued was £61,395, while for September the official figures are given as £61,980 13s., thus showing a lead for the month of £585 13s

* * * *

The cyanide plant installed on the Dreadnought mine has been fixed up by Mr. H. C. Krogh and is now in complete order and ready for use.

* * * *

Energetic improvements are being made on the Emerald property and additional plant is coming forward from Que Que. The equipment will be erected as rapidly as possible, and it is anticipated that operations will be in full swing at an early date.

* * * *

Messrs. Kier & Rooke are busy with the erection of a 10-stamp mill and cyanide plant complete at the Arlandzer, says the *Gatooma Mail*. The installation of this plant is being pushed forward very vigorously and the most sanguine hopes of substantially increased profits are entertained by the owners upon its completion.

* * * *

With the exception of the Nissen stamps, the installation of the new Eileen Alannah reduction plant is now complete. When these stamps are in working order, this reduction equipment will take its place as the finest ever set up in Rhodesia.

* * * *

After a period of more than twelve months' inaction, Mr. McAdams has resumed work with his 5-stamp battery at the Masterpiece. Operations, however, are not yet in full time swing, as, in common with most mines in the district, milling is much retarded owing to insufficiency of water.

* * * *

Mr. Jack Mack is engaged in installing a large Ingersoll Rand Company's compressor at the Golden Valley, and intends using a full range of rock drills for sinking, stoping and driving.

* * * *

The additions to the reduction plant on the Cam and Motor mine are being rapidly pushed ahead, and the extended operations are calculated to result in a short space of time in a materially increased tonnage.

* * * *

The report of the Executive Committee for the month of September, 1914, states:—The following is a summary of the returns of native labourers employed on Southern Rhodesian mines during the months of July and August, 1914:—

	July.	August.
Local	14,336	13,005
Portuguese Territory ...	6,665	6,587
N.W. Rhodesia	3,858	4,080
N.E. Rhodesia	5,858	5,562
Nyasaland	7,160	7,581
Other sources	930	945
	38,807	37,760

The number employed in August, 1914, shows an increase of 2,041 as compared with the same month of 1913. Particulars have now been received as to the arrangements made in London by the British South Africa Company and the Buying Committee for the supply of zinc for Rhodesian mines. The Chamber's estimate of requirements of 40 tons per month has been arranged for. The first shipment ex s.s. Kasenga is expected shortly at East London, and efforts are being made by your Committee to secure substantial reduction in the rail rates from that port on this article. The output of gold from Southern Rhodesia for the month of September has been declared at 74,141·66 ozs. fine gold, valued at £309,397, being a decrease of 1,857·3 ozs. in weight and £7,575 in value as compared with the month of August. The output of other metals and minerals was declared as follows:—Silver, 14,756·61 ozs., valued at £1,366; lead, 12·44 tons, valued at £206; copper, 169·09 tons, valued at £8,455; chrome iron, 3,248 tons, valued at £7,250; coal, 30,471 tons, (sales) £9,857; diamonds, 91·5 carats, valued at £456. The total value of gold and mineral production for the month was thus £336,987, as compared with £347,659 in the month of August.

* * * *

The fourteenth annual general meeting of the Scottish Mashonaland Gold Mining Company, Ltd., was held recently at Salisbury House, London Wall, E.C., Mr. Walter Forbes (chairman of the company) presiding. Mr. James William Clark, representing the secretaries (the Gold Fields Rhodesian Development Company, Ltd.), having read the notice convening the meeting and the report of the auditors, the Chairman said: Last year, at the annual meeting, the shareholders agreed to the writing down of the capital and to reducing the value of the shares from the denomination of £1 to 10s., and, in accordance with the wishes of the shareholders, we went to the Court, who sanctioned this cutting down. Some of the shareholders were of opinion that we were not sufficiently drastic in our cutting down, and at the moment their criticism seems to be justified, but I would ask the shareholders to defer final judgment till we can have what I may call a normal year, instead of a year, or possibly two years, of battle, murder and every conceivable horror of war in Europe. The principal alterations in the accounts, therefore, arise from this reduction. The nominal capital is £63,025, in place of £126,050, and, on the other side of the account, our mining properties are shown at £2,025, as against £5,777 in the previous year, and our share and debenture investments at £65.697, as compared with £125,307 previously. The market value of these investments at 30th June, which concluded a year during which there had been but one continuous decline in values, was £37,402, and unfortunately at the present time it is out of the question to make any comparison with former figures. We have, however, confidence in the value of the great majority of these assets, and can now only await with quiet confidence and return, which we hope will not be greatly prolonged, to more normal conditions. There is one item in the profit and loss account to which I will draw your attention -that is, the royalties from the claims tributed—namely, the Venus and the May properties—amounting to £492. We have written £225 off the value of the Venus claims, standing in our books at £250, leaving them at a cost now of only £25, while at present we are leaving the value of the May claims at the same figure at which Mr. H. E. Jones valued them—that is, £2,000. We have every reason to hope that this item of royalty for claims tributed will continue to be satisfactory; in fact, the royalty for the month of July was quite good, amounting, as it did, to the sum of £131. The amount of money received from dividends is slightly smaller than last year, but again in this respect, if we could only get normal years, the sum would unquestionably be largely added to. Many of our investments paid before the last few unfortunate years handsome dividends and in normal times would undoubtedly do so again. Under present conditions I do not think I need dwell at any length on the character of our investments, which, at the wish of several shareholders, we detailed in the directors' report. At the same time I do not promise always to give these details, as it is not always to the advantage of the company to do so. I think you will agree with me that this publication or non publication must be left to the discretion of the directors. I also consider it somewhat a waste of time for me to speculate on the future at least until the Allied Armies have stamped out the cultured bullies and blackmailers of Europe. When that occurs and occur it assuredly will we shall be in a better position to judge of its effect in the world of finance, but that the effect will be great and beneficial no one can possibly doubt. As regards our securities in the Transvaal and

Rhodesia, although we are engaged in war in South Africa, as elsewhere, it does not at present seem that the damage is likely to be very severe, and I trust that the mines in both countries will be able to carry on their crushings and development. Generally speaking, the situation in Rhodesia is encouraging, as is evidenced by the largely increased monthly output, which, I think, is mainly caused by the coming into production, as we mentioned in our report, of properties in which we are substantially concerned through our large holding in Gold Fields Rhodesian Development Company. We have endeavoured to keep expenses down to the lowest possible point, and to aid this desired end we, as directors, have again voluntarily reduced our fees to slightly over £50 apiece. The Chairman concluded by moving the adoption of the report and accounts.

Major C. E. Norton seconded the motion, which was carried unanimously.

The retiring director and auditors were re elected, and the meeting terminated.

* * * *

It may be partly owing to the war, but most probably the same decision would have been arrived at in any case, that the Government has decided not to interfere at this juncture with the British South Africa Company's administrative position in Rhodesia. However, a supplemental charter is being prepared giving effect to an arrangement to which the Directors of the Chartered Company have agreed to render possible the establishment of responsible government in Southern Rhodesia at some date other than that which the Charter permits. The following is the text of the statement on the subject issued by the Colonial Office:—

His Majesty's Government have had under their careful consideration the question of the future administration of the territories at present administered by the British South Africa Company. Clause 33 of the company's Charter, which bears date 29th October, 1889, reserves to the Crown the power, at the end of twenty five years from the date of the Charter, and at the end of every succeeding period of ten years, to add to, or repeal, any of the provisions of the Charter, or to enact other provisions in substitution for, or in addition to, any of its existing provisions. It is further provided that this power shall only be exercised in relation to so much of the Charter as relates to administrative and public matters, and, failing the exercise of this power, the Charter is automatically extended for another ten years. His Majesty's Government art advised that there is no power, either in the Charter or elsewhere, to shorten or vary the periods, at the end of which addition to or alteration or repeal of the administrative provisions of the Charter is possible. The directors of the British South Africa Company have, however, informed Mr. Harcourt that they would not regard the non-exercise by His Majesty of his right of reviewing on 29th October such of the provisions of the Charter as relate to administrative and public matters as any bar to the establishment of responsible government, should the time appear to be ripe for such a step during the ten years which would elapse before, under the terms of the Charter, His Majesty's right of review would become exercisable, and that if during these ten years the inhabitants of Southern Rhodesia should find that they were financially and in other respects strong enough to assume, with the concurrence of His Majesty's Government, the burden of administration, and should express through the Legislative Council their desire to assume that burden, they (the directors) would be most willing that effect should be given to that desire. In view of this statement and of the desire expressed by the Legislative Council for the continuance of the company's administration, His Majesty's Government have decided not to advise His Majesty to exercise the powers reserved by Article 33 of the Charter, and its administrative and public provisions will accordingly not be modified. His Majesty will, however, be advised in due course to issue a supplemental Charter giving effect to an arrangement to which the directors of the British South Africa Company have agreed to render possible the establishment of responsible government in Southern Rhodesia should the Legislative Council desire it and should His Majesty's Government concur at some date other than that which the Charter permits.

MINING MEN AND MATTERS.

Mr. Lewis Kelsey, Secretary of the Chamber of Mines, has returned.

* * * *

The next monthly meeting of members of the Geological Society of South Africa will be held in the Council Chamber, Chamber of Mines, Johannesburg, on Monday evening, 9th November, 1914, at 8.15 p.m. The following papers will be read:—"New Cretaceous Fossils from Brenton, Knysna," by E. H. L. Schwarz, A.R.C.S.; "The Geology of the Swaziland Coalfield," by J. Jervis Garrard.

South African Railways.

The following is a summary of the approximate earnings of the South African Railways for the forty-two weeks ended the 17th of October, 1914, as compared with the actual earnings for the corresponding period of the previous year, viz.:—

	1914. (42 weeks). £	1913. (42 weeks). £
Passengers	2,637,306	2.713.570
Parcels	279,503	289,790
Goods	4,433.405	4,845,150
Coal	1,539,240	1,531,344
Livestock	331.140	312.675
Miscellaneous	271,332	262.440
Totals	9.491,926	9,954,969

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RAND YIELD, COSTS, AND PROFITS IN SEPTEMBER.

Transvaal Chamber of Mines' Monthly Analysis of Gold Production.

THE WITWATERSRAND.

	Total value recovered	Value recovered per ton milled		Total working cost per ton milled		Working profit	Working profit per ton milled	
	£	s.	d.	s.	d.	£	s.	d.
1. Aurora West United	17,968	25	3	18	6	4.615	6	6
2. Bantjes Consolidated	26,179	24	11	22	7	2 199	2	1
3. Brakpan Mines	73,876	26	10	17	8	25,922	9	9
4. City and Suburban	48,016	34	4	20	3	19,280	13	9
5. City Deep	86,310	39	4	21	7	38,102	17	4
6. Consolidated Langlaagte	63,779	25	6	14	4	27,988	11	2
7. Consolidated Main Reef	37,354	29	10	20	0	11.539	9	2
8. Crown Mines	247,766	25	11	15	7	96,113	10	1
9. Durban Roodepoort	14,931	21	4	15	7	4,023	5	9
10. Durban Roodepoort Deep	35,299	27	8	23	5	5.050	3	11
11. East Rand Proprietary	227,666	26	4	17	5	72,628	8	8
12. Ferreira Deep	94,474	36	0	18	2	45.751	17	5
13. Geduld Proprietary	38,336	33	3	24	10	9,564	8	4
14. Geldenhuis Deep	60,335	28	8	24	3	8 701	4	2
15. Ginsberg	16,558	22	2	17	8	3,342	4	6
16. Glencairn Main Reef	15,041	13	6	11	4	2.291	2	2
17. Knight Central	29,433	22	1	18	5	4.383	3	3
18. Knights Deep	77,330	15	6	11	10	17,389	3	6
19. Langlaagte Estate	59,842	21	8	17	5	16,231	6	6
20. Luipaardsvlei Estate	20,487	21	3	18	4	2,412	2	8
21. Main Reef West	25,422	22	1	19	0	3,076	2	8
22. May Consolidated	9,005	16	4	15	8	375	0	8
23. Meyer and Charlton	33,017	45	1	17	1	20,137	27	6
24. Modderfontein B.	67.135	36	11	16	8	36,267	19	11
25. New Goch	31,705	20	4	13	4	10,937	7	2
26. New Heriot	23,902	36	9	21	0	10,001	15	4
27. New Kleinfontein	68,210	26	3	17	5	22.967	9	0
28. New Modderfontein	95,264	37	4	14	8	56 934	22	4
29. New Primrose	24,280	21	9	13	1	9,603	8	8
30. New Rietfontein	7,119	14	10	16	0	30	0	1
31. New Unified	13,831	20	7	13	0	5,001	5	4
32. Nourse Mines	63,609	26	0	20	5	13,013	5	4
33. Princess Estate	28,065	25	3	23	7	1,799	1	7
34. Randfontein Central	249,299	23	0	16	1	72,282	6	8
35. Robinson	87,902	32	2	14	3	48,277	17	8
36. Robinson Deep	72,186	29	6	17	6	27 503	11	3
37. Roodepoort United	25,631	15	3	15	5	305	0	2
38. Rose Deep	70,253	24	0	16	8	21,289	7	4
39. Simmer and Jack	67,853	20	1	12	6	24,646	7	4
40. Simmer Deep	46,555	17	6	16	5	3,405	1	3
41. Spes Bona Tribute	5,029	17	9	—		—	—	
42. Van Ryn	48,292	26	4	14	4	21,627	11	10
43. Van Ryn Deep	70,121	33	2	15	3	37,923	17	11
44. Village Deep	72,598	28	7	17	8	26,815	10	7
45. Village Main Reef	64,095	38	0	16	11	34,922	20	9
46. Vogelstruis Estate	14,383	21	5	19	11	1,577	2	5
47. West Rand Central	3,581	32	0	28	7	377	3	4
48. West Rand Consolidated	33,192	22	9	18	8	6,172	4	4
49. Witwatersrand	51,729	25	7	13	9	24,022	11	11
50. Witwatersrand Deep	57,196	25	4	16	6	18,702	8	3
51. Wolhuter	40,791	24	8	16	11	12,302	7	6
Miscellaneous producers	13,750			—		—	—	
Witwatersrand totals	2875983	25	11	16	9	989,859	9	1
				50 cos.		50 cos.	50 cos.	

OUTSIDE DISTRICTS.

	Total value recovered	Value recovered per ton milled		Total working cost per ton milled		Working profit	Working profit per ton milled	
	£	s.	d.	s.	d.	£	s.	d.
HEIDELBERG								
1. Nigel	12,964	27	9	30	10	*1,610	*3	5
2. Sub Nigel	8,725	37	1	32	10	1,734	7	4
BARBERTON								
3 Barrett	1,384	7	2	—		—	—	
4. Sheba	12,063	35	7	24	8	3.698	10	11
5. Worcester Exploration	4,685	14	10	12	6	900	3	0
KLERKSDORP								
6. Quest	2,629	13	10	13	2	135	0	9
LYDENBURG								
7. Ceylon Lydenburg	1,007	31	8	21	1	320	10	0
8. Glynn's Lydenburg	7,956	39	3	18	6	4,084	20	2
9. Transvaal Gold Mining Estates	34,993	47	3	21	2	18,872	25	6
Miscellaneous producers	20,241	—		—		—	—	
Totals (outside districts)	106.647	31	11	22	8	28,133	11	3
*Loss.				8 cos.		8 cos.	8 cos.	
Totals (Witwatersrand)	2875983	25	11	16	9	989,859	9	1
				50 cos.		50 cos.	50 cos.	
Grand totals	2982630	26	1	16	11	1017992	9	1
				58 cos.		58 cos.	58 cos.	

The committee meeting of the Australasian Merchants' Association has passed the following resolution:—"With the object of combating the known intentions of German shipowners to retain their interest in the New York-Australasian freight service after the war is over, the Australasian Merchants' Association of London strongly recommends its members and all Australasian exporters and importers to confine their shipments exclusively to steamers approved by Messrs. Norton, Lilly and Co., New York, representatives of British shipowners."

A further Proclamation has been issued specifying additional articles which are to be treated as contraband of war in accordance with the previous proclamations of August 4 and 12. The present proclamation states that it is expedient to introduce certain further modifications in the Declaration of London as adopted and put in force, and notwithstanding anything contained in Article 28 of the Declaration, the following articles shall be treated as conditional contraband: Copper, unwrought; lead, pig, sheet, or pipe: glycerine; ferro-chrome; haematite iron ore; magnetic iron ore; rubber; hides and skins, raw or rough tanned (but not including dressed leather). Article 28 of the Declaration of London contains a list of articles which are not susceptible of use in war.

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SOME 1914 RESULTS:—
MANAGERS - - - January and May - - ALL Passed.
ELEC. ENGINEERS - February - - - - - 66% ,,
MECH. ENGINEERS- June (Kimberley Centre) - - ALL ,,
MINE OVERSEERS - - - - - Practically ALL ,,
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INVESTORS' DIARY.

FORTHCOMING COMPANY MEETINGS.

Nov. 10 Johannesburg Consolidated Investment Company.
Nov. 16.—Nourse Mines; Mew Modderfontein.
Nov 20. Glynn's Lydenburg.
Nov. 27.—Consolidated Main Reef; Main Reef West.
Dec. 11.—Elandsfontein Estate.

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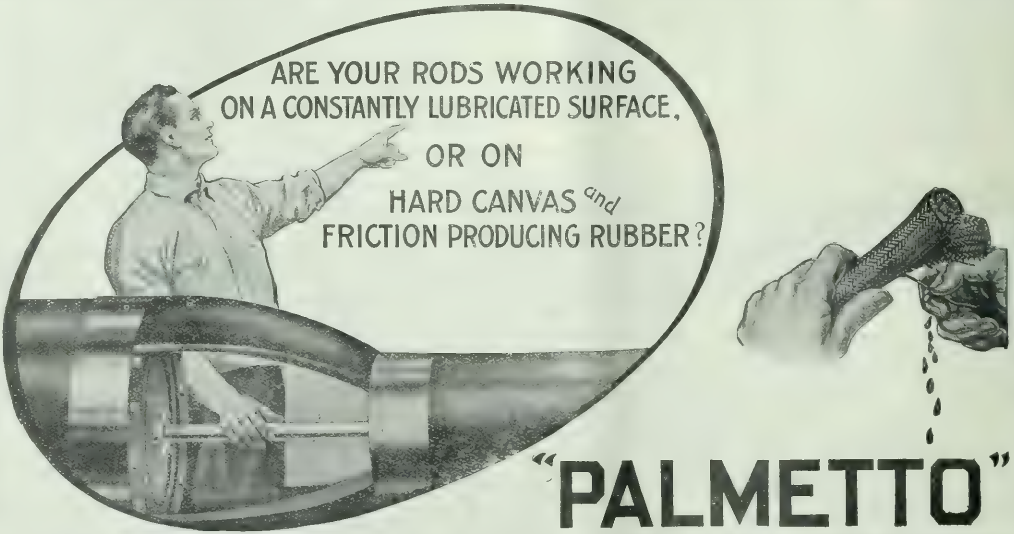
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Engineering Notes and News.

Dredge Construction in Portuguese East Africa.

The recent construction of a 7½ feet California type, all steel electric dredge by the Bucyrus Co., in Portuguese East Africa, is of considerable interest to those connected either with dredge construction companies or with dredge operation. To each, it opens up new possibilities. This dredge is one of six California type dredges to be ordered in America for foreign countries. The Kolchan dredge of the Orsk Company in East Siberia, which was built by the New York Engineering Co., was the first modern California type dredge to be built in a foreign country. Other California type dredges are the Pato on the Nechi River in Columbia, built by the Yuba Construction Co., two dredges in the Philippine Island, one built by the New York Engineering Co., the other by the Yuba Construction Co., and a dredge for the recovery of tin for the De Sabla interests near Belmonte, Portugal, designed by the Union Construction Co., and built by Fraser & Chalmers. The latter dredge is the first of American type built for tin recovery in a foreign country. All of these dredges are now operating successfully. In addition to the above, the Marion Steam Shovel Co. has shipped the machinery for a 7 feet dredge to the Ural district in Siberia. It can be seen that nearly all the American dredge builders are now represented in foreign countries. Without doubt the success of these boats will attract more attention to American dredges, and American builders will be consulted upon proposed installations of some importance. The Andrada dredge was built by the Bucyrus Co., and was constructed by C. T. Nicholson. The dredge was constructed entirely of steel, equipped with 63 buckets of 7½ cubic feet capacity, and arranged to dig 25 feet below water level. The dredge was shipped from New York by steamer, the last shipment being March 13, 1913. The point of delivery was Beira, Portuguese East Africa. From this point freight was hauled by the Beira and Mashonaland Railway, a distance of about 200 miles, and from the railroad to the property, a distance of eight miles, freight was hauled by means of mule and ox teams. Eight head of oxen, comprising one team, would make a trip one way in three hours. The maximum load for these teams is 3½ tons. To handle the steel spuds and other heavy parts of the dredge, two sets of wheels and axles capable of carrying 25 tons were built and shipped with the dredge. These wheels were 5 feet in diameter and had a 10 inch face heavily tyred. To haul the spuds, which were the heaviest pieces of the dredge, 30 mules and 50 oxen were required. The digging ladder, which was of the plate girder type, was shipped in three sections. As is customary under conditions prevailing in foreign countries, considerable delay was experienced in getting freight to the property on account of the poor transportation facilities. All dredge parts were on the ground by June 15, the last delivery being the material that was first required. The dredge pit had been prepared before the arrival of the construction engineer at the property, and actual construction began on the 25th day of June. Included in the equipment furnished for construction was a Curtis double compressor with 35 h.p. motor. This was a two-cylinder 10 by 10 vertical compressor, and required only 4 by 6ft. floor space. It gave great satisfaction and furnished air at 83 lb. pressure for seven riveting hammers, two caulking hammers, and two air drills. For the machine shop a special lathe was taken that could either handle small work or swing the lower tumbler if necessary. This was arranged by having, with other accessories, blocks to raise the head and tail stock to any height desired.—*Mining and Scientific Press.*

The Lubricants Market in South Africa.

The gold mining industry of the Transvaal is responsible for the consumption of a considerable proportion of the lubricants imported into this market. The quantity purchased by the Transvaal gold mines in 1910 was 999,308 gallons. In addition, however, to the gold mines of the Witwatersrand, there are other mining centres which must be reckoned with, such as the mines of Rhodesia, the diamond mines of Kimberley and of Pretoria, the coal mines of the Transvaal and of Northern Natal; these, taken together, are important factors in the matter of oil consumption. Further, there are the large electrical power stations of the Witwatersrand, and those municipally controlled in the larger towns throughout the country. The South African railways also are large consumers of lubricants.

Pneumatic Coal Transportation.

In a paper read before the South Wales Institute of Engineers, Mr. Edward Koenings describes a pneumatic method of transporting small coal, such as peas, nuts, etc., which has met with some success. It is pointed out that the pneumatic principle has been applied in practice to the transport of seed, more especially corn, but only recently to coal. Small coal is not so uniform in size as a certain quality of grain, and it usually contains moisture which makes its suction into pipes difficult; a secondary trouble is the dust created. The difficulties have, however, been surmounted and the author proceeds to describe actual plants in use. One of these in Austria deals with 200 tons of coal in 24 hours, and consists of a double cylinder air pump by means of which a vacuum of about [illegible] inches is created in a cylindrical receiver, and two cylindrical dust catchers. To the lower part of the receiver three flexible suction pipes lead, each fitted with an isolating valve, so that either pipe may be used, two being for unloading wagons and one leading to a coal storage 200 yards away. Each suction pipe is fitted at the inlet with a special nozzle, and when in use the incoming current of air carries the coal and dust to the receiver, where the

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coal falls by its own weight into the lower conical part, it is ejected through an automatic airtight discharge valve on to an automatic weigher and subsequently passed to a receiving bunker. The dust in suspension in the receiver is drawn into the filters, collected and discharged in the same way as the coal, the remaining air passing through the pump for discharge to the atmosphere. The only attendants required by the plant are the engineer in charge of the pump and the workman looking after the suction nozzle. The only important mechanism is the pump, and the operation is dustless so far as the workers are concerned. Another (German) plant is described for feeding 15 boilers. In this case the coal is taken from barges 160 yards away, lifted 110 feet and passed through the type of receiver mentioned, weighed and deposited in bunkers by means of a belt conveyor. In this instance no filter is used, as a dry lubricating air pump is installed, and dust collectors are fitted between the receiver and pump. The pump is rated at 2,450 cubic feet per minute; the capacity of the plant, 25 tons an hour from the barge, is increased to 45 tons if coal is taken from a bunker close to the receiver. The power required is 65 h.p., and the attendance from two to three men, it is estimated that the plant will pay for itself in two years. Another plant deals with eight tons an hour, over 100 yards and a height of 70 feet, and requires 13 h.p. The writer considers this form of transport most useful over a distance of 100 to 300 yards, the limiting size of coal he fixes at 2 inches, and of moisture at 6 per cent. He suggests that there may be scope for such apparatus for lifting small coal from the pit bottom to the surface.

Willans & Robinson, Ltd.

Within a few weeks of war being declared, over 20 per cent. of the total male office and works staff, irrespective of age, joined the Services, a record the firm has every reason to be proud of. Lord Kitchener has conveyed in a letter to the firm his special thanks. Places are being kept open, and half pay rates paid for those who joined in that period. The company have always maintained a close connection with the Army, and contributed largely to the formation and support of a Howitzer battery formed some years ago, whose headquarters adjoin the works. The company have in hand several orders for war material and have acquired a special interest in aeroplane engine work, the company having secured, prior to the war period, the sole British manufacturing rights for the well-known "Salmson" engine (Canton Unné system).

One effect of the war has been to cause a sudden shrinkage in the number of applications for patents in the United Kingdom. Normally, the Patent Office deals with 100 a day. According to official figures, only 250 applications were registered during the week ending October 3rd, and the work of the examining branch has fallen off considerably. A well-known patent agent explains that the drop is partly due to lack of money and partly to the loss of men who may be inventors. There are a number of inventors among the rank and file, who in peace times are working in engineering works in commercial centres and whose employers are willing to put facilities in their way to patent their ideas. But quite apart from their employers, many take out patents themselves. Then there is another cause. During peace we are affected to a very large extent by the influx of applications from foreign countries. That source is now interrupted, although applications are coming from the Scandinavian countries. Germany supplied a good proportion of applications, and completed 3,000 specifications annually.

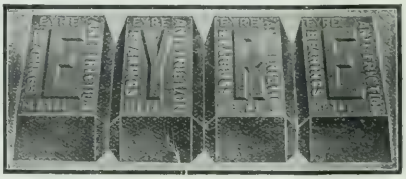
The Implement and Tool Trade. In South Africa it is evident that German manufacturers have made determined efforts to secure an increased share of the implement and tool trade, as the value of their sales shows a tendency to increase during the three years under review, while that of the total imports shows a continued decline. H.M. Trade Commissioner in South Africa, in the course of a special report, says success in trading in the South African market depends largely upon the efficiency of local representation, and the disposition on the part of manufacturers to follow up the suggestions put forward by their South African agents. Attention is continually being drawn to the enterprise of agents of foreign firms, and the commonsense of the foreign manufacturers in readily adapting themselves and their wares to the stated requirements of the market. As regards tools used by skilled mechanics, the statement is invariably met with that British tools lack the finish of American tools, and undoubtedly the utmost importance is attached to this point in the sale of the goods. The packing of these American goods is also admirable in every sense, and altogether the position calls for serious consideration. The Commissioner quotes a letter from a merchant of long standing, in which the latter declares that he has no hesitation in stating that England is steadily losing ground in nearly all classes of iron and steel hardware and tools, and this is due to the failure on the part of British manufacturers to adapt themselves to the conditions existing in the colonial markets, and to their unwillingness to comply with the general desire for style and convenience regarding boxing and casing of goods.

* * * *

The Municipality of Gwelo are inviting tenders for the installation of the water service of Gwelo. The water supply has been obtained from boreholes in the town, and tenders may be for either: (a) The supplying and installation complete of the pumping plant, storage tanks, mains and piping, or (b) the supply of the required plant and materials only. Full particulars of the work may be obtained on application to the Town Clerk, on payment of a fee of three guineas, which will be returned on receipt of a *bona fide* tender.

New Patents.

376. Thomas Brown and Leif Knudsen.—Improvements in rock drills and rock drilling machine bits.
377. Frederick Jonthan Buchler.—Pump regulator and sampler.
378. Leland Laflin Summers. Improvements in coking processes.
379. Leland Laflin Summers. Improvements in coking ovens.
380. Mather Williams Sherwood.—Power drilling machines.
381. Charles Herman Haeseler.—Power drilling machines.
382. William Jones. Improvements in jockeys or rope grips for use in mechanical haulages.
383. Hyam Goldstein. An improved fuel for internal combustion engines and the like.
384. William Parr Lightbody, Ole Kornelius Olsen, and John Martin Siebert.—Improvements in rope supporting rollers for mine shafts haulage trucks and the like.
385. James Charles Hoskins Vaughan. Improvements in and relating to chucks for rock drills.



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Finance, Commerce, and Industries.

An Institute of Commerce.

The proposal to form an Institute of Commerce representing all the specialised sections of British trade is making considerable progress. Some of the objects of the organisation will be to secure (1) Proper banking credits and more elasticity in the currency system as it affects industry; (2) the establishment of an efficient commercial Consular service kept directly in touch with the requirements of the British manufacturers; (3) the careful investigation of railway rates and freight rates, and the removal of all inequalities injuriously affecting our traders. The one and only thing that British industry can do at the moment is to organise and carry the principle of organisation within organisation a step further, so that at the conclusion of the war advantage may be taken of our freer currency system and other opportunities that may arise. It is for the development of trade with the Dominion, Colonial and oversea neutral markets that British manufacturers may look for the greatest benefits after the war.

* * * *

Appeal by Imperial Council of Commerce.

The secretaries of the leading Chambers of Commerce have received the following communication from the British Imperial Council of Commerce, which bears the signature Lord Desborough (President): War having been forced upon the Mother Country by the action taken by the German Government, the British Imperial Council of Commerce, which forms the link between the Chambers of Commerce and Boards of Trade of the British Empire, ventures to make an appeal to its constituent bodies in this emergency and to direct their attention to those departments of commerce which are principally affected by the stoppage of the trade hitherto carried on by "enemy" countries and the British Empire. The watchword of the various congresses of Chambers of Commerce of the Empire has been "unity in commerce and unity in defence," and, following on the splendid and spontaneous offers of armed assistance to the Motherland in her time of trial from all parts of the British Empire, it would seem a fitting opportunity to give reality to the first part of the double aspiration, and place our inter-Empire trade on a more lasting basis. We have no reason to be grateful to Germany in the past for the methods by which she has sought to undermine an inter-Empire trade in an Empire which she did nothing to found, and which she is now doing her best to overthrow, and it would ill become the Chambers of Commerce not to seize the opportunity to repel these attacks and to hold and consolidate our own. It is therefore suggested that if your Chamber, from its knowledge of the local conditions, would address representations to the Secretary of the British Imperial Council of Commerce indicating the best methods of supplanting this "enemy" trade by an Imperial interchange of commodities, no better means could be found for furthering the objects which the Chambers of Commerce of the Empire have at heart. The Congress of Chambers of Commerce meets next autumn, at Toronto, when it is hoped that these questions will receive special and practical attention. In this fight for national and Imperial existence the great importance of economic pressure should not be overlooked. It is as important a means of bringing the struggle to an early and successful close as the sinking of ships and the slaying of men: navies cannot be kept on the seas or armies in the field unless the trade and wealth of the country are maintained: we must also look to the future to repair the ravages of the past. It is hoped that your Chamber will do its best, by its advice and assistance, to help in this good work.

* * * *

Home Trade and the War.

The Board of Trade returns show that the British imports for September amounted to £45,051,937, a decrease of £16,303,788, while the exports totalled £26,674,101, a decrease of £15,750,763. The exports show an improvement as compared with August, the decrease last month being 37·1 per cent. as compared with 45·1 per cent. in August. The only increases in imports during the month were grain and flour £658,051, raw wool £38,307, paper-making materials £509,561, and new ships £9,062. The whole of the remaining imports showed decreases, the principal being meat (including animals for food) £628,041, other non-dutiable food and drink £1,791,220, wool and timber £2,290,851, raw cotton £1,610,771, and iron and steel and manufactures thereof £923,640. There were only three increases in exports for the month, these being grain and flour £5,708, raw textile materials other than cotton and wool £3,049, and hides and undressed skins £23,354. The chief decreases were coal, coke and manufactured fuel £1,851,658, iron and steel and manufactures thereof £1,663,921, machinery £1,123,511, manufactured cotton £3,661,502, and manufactured wool £1,327,275. The imports for the nine months amounted to £522,517,311, a decrease of £35,249,388, and exports to £350,748,363, a decrease of £40,007,246.

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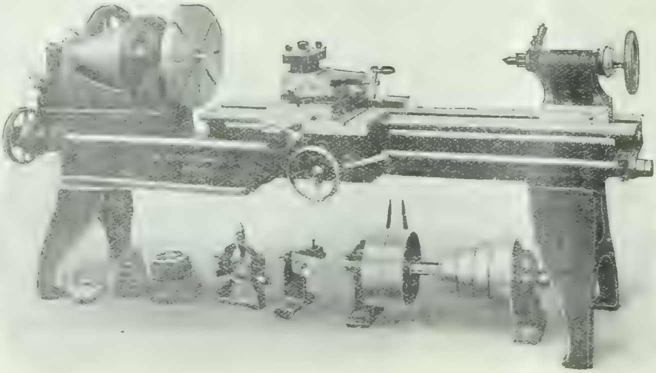

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AMUSEMENTS.

NEXT WEEK'S PROGRAMME.

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Commercial Community and Government. At the last meeting of the Chamber of Commerce the Chairman, Mr. Holdcroft, paid a tribute to the manner in which the Union Government has acted towards the commercial community. They were, he said, indebted to the Government for the prompt manner in which the Government had assisted them. They should, therefore, equally do all in their power to help the Government and see that the King's proclamation in regard to trading with the enemy is obeyed in letter and spirit.

* * * *

The War and Portuguese East African Trade. His Majesty's Consul-General at Lourenco Marques reports (September 15th) that German blue prints constitute the most important item of goods imported from Germany, measurements being 38, 32 and 28 ins., selling at 7d., 6½d., and 5d. per yard, with 6 per cent. added to cover cost of insurance, freight, etc., German firms are in the habit of granting 90, 120 and even 150 days' credit. It is stated that manufacturers of railway material in the United States of America are anxious to obtain a footing in Portuguese East Africa.

* * * *

Another Profitable War Industry. Mr. Arthur Little, Lecturer in Poultry, School of Agriculture, Grootfontein, Middelburg, Cape Province, writes in Press Circular No. 12, of the Department of Agriculture:—

"In view of the war which is being waged in those countries of Europe that are the chief producers and suppliers of the eggs and poultry which are imported into this country, these products will very shortly cease to be imported, and for an indefinite period none will be coming in, not only so but Great Britain, which draws a large amount of its supplies from these countries will perforce have to look elsewhere for them. "It is an ill wind which blows nobody any good," and farmers and poultry keepers of South Africa, here is your opportunity; seize it at once and do your utmost, once and for all time, to keep that £80,000, which has been going out of South Africa annually for these products, in the country, and also to capture a large portion of the trade, which Germany and other countries have heretofore carried on with Great Britain in poultry and eggs. Anyone and everyone can do his or her share and participate in the profit. The chief producers of poultry and eggs in France, Denmark, Belgium, Russia and Germany have been the small farmers and peasants; in fact these people who have very little ground at their disposal, and they have from these products, with, in some cases, the addition of a pig or two, a few vegetables and some fruit, been making a comfortable living."

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Johannesburg Consolidated Investment Company, Limited.

(INCORPORATED IN THE TRANSVAAL.)

NOTICE OF GENERAL MEETING OF SHAREHOLDERS.

NOTICE IS HEREBY GIVEN that the Ordinary General Meeting of Shareholders in the above-named Company will be held in the Board Room of the Johannesburg Consolidated Investment Company, Limited, on TUESDAY, THE 10TH NOVEMBER, 1914, at 11.30 o'clock in the forenoon, for the purposes following:—

To receive and consider the Statement of Accounts and Balance Sheet for the period ending the 30th June, 1914, and the Report of the Directors and Auditors thereon.

To elect four Directors in place of those retiring, in terms of the Company's Articles of Association.

To elect Auditors and to fix their remuneration for the past financial year, and to transact any other ordinary business of the Company.

By Order of the Board,
W. H. MARDALL,
Secretary.

Johannesburg,
23rd September, 1914.

35387

Elandsfontein Estate Co., Ltd.

(INCORPORATED IN THE TRANSVAAL.)

NOTICE TO SHAREHOLDERS.

NOTICE is hereby given that the Twenty first Ordinary General Meeting of Shareholders in the above Company will be held in the Board Room, Consolidated Gold Fields Buildings, Simmonds Street, Johannesburg, on FRIDAY, the 11th DECEMBER, 1914, at 11.15 o'clock in the forenoon, for the following purposes, viz.:

1. To receive the reports of the Directors and Auditor, and to consider the Balance Sheet as at 31st October 1914, and Profit and Loss Account for the year ended 31st October, 1914.
2. To elect two Directors in the places of Messrs. D. Christopherson and F. R. Lynch, who retire by rotation but are eligible and offer themselves for re-election.
3. To appoint an Auditor for the ensuing year, and to fix the remuneration for the past audit.
4. To transact such other business as may be transacted at an Ordinary General Meeting.

The Transfer Books of the Company will be closed from the 7th to 11th December, 1914, both days inclusive.

By Order of the Board,
THE CONSOLIDATED GOLD FIELDS OF SOUTH AFRICA, LIMITED,
Secretaries.
per A. C. GRANT.

Head Office:
Consolidated Gold Fields Buildings,
Simmonds Street, Johannesburg;
2nd November, 1914.

38088

The Week's Company Meetings.

RAND KLIP.

"Marking Time."

At the annual meeting of the Rand Klip this week the chairman, Mr. W. Dalrymple, in moving the adoption of the report of the directors and accounts, said: The balance sheet shows that the cash in hand, after allowing for sums due to sundry creditors, amounts to £13,137. The gross expenditure on the maintenance of the property was £1,991, the chief items being: Mine general expenses, caretaking, secretarial charges, etc., £1,272; Miners' Phthisis Board contribution, £385. The revenue credited in the account was: Rents from farm and sundries, £481; interest on fixed deposits, £424. The net expenditure for the year was therefore £1,086. The property has been in the hands of a caretaker throughout the year. The plant, equipment, buildings, etc., have been kept in good order. There has been no opportunity during the past year to provide working capital to effectively open up the property, and the conditions prevailing prevent any possibility of obtaining additional working capital for the time being, and in the meantime the expenses are being kept as low as possible. The results obtained by neighbouring companies in the course of their development indicate that your property is in an area which holds out great promise. While the initial development on the first and second levels of your mine was, unfortunately, disappointing, it is characteristic of all the mines of the Far East Rand district that comparatively large unpayable sections are encountered, alternating with highly payable areas. Judging, however, by the value obtained on our lowest level (8.4dwt. over 27.4in.), there is the indication that we were probably getting on to one of the payable areas, when, owing to the company's financial position, we were forced to suspend work. Our immediate neighbour, the Cloverfield Mines, has, like ourselves, remained shut down during the year, but the nearest working properties, the Modder B and Geduld, have shown improved results. In general, the Far East Rand district, in which the property is situated, has made steady progress, both as regards producing mines, such as the New Modder, Van Ryn Deep, Geduld and Modder B, and as regards developing mines, such as the Modder Deep, Government Areas, and Springs Mines. Since the last meeting, Messrs. Higgins and Eckstein resigned from the directorate, and Messrs. Gau and Nelson have been appointed to fill the vacancies. You will be asked to confirm these appointments. It is with regret that I have to record the death of your auditor, Mr. Thomas Douglas. The firm is being carried on under the name of Messrs. Douglas, Low and Company, and I should like to recommend that this firm be appointed auditors to your company. I now beg to formally move the adoption of the directors' report and statement of accounts for the year ended the 30th of June, 1914.

Mr. Gau seconded, and the motion was carried. The retiring directors were re-elected and the auditors reappointed.

KNIGHTS DEEP.

Some Disappointments.

Bright Prospects.

The sixteenth ordinary general meeting of shareholders in the Knights Deep, Ltd., was held last week in the board-room, Consolidated Gold Fields. Mr. D. Christopherson presided, and there were present Messrs. A. G. Gill, W. S. Smits, H. H. Oldroyd, D. W. Rossiter, G. C. White, F. L. Brown, F. M. Cowan and A. C. Grant, secretary, representing 586,419 shares out of an issued capital of £743,526. In the course of his review, Mr. Christopherson said: The results obtained last year were most disappointing, not only to shareholders, but also to those who are responsible for the management of your property, including, I may say, your technical advisers. Instead of an anticipated increase in profits as compared with last year, there is a decrease of £32,000. This unsatisfactory result is due to various causes. Firstly, the average yield per ton crushed shows a fall of 5.587d., or say, .1107dwt., which on the total tonnage crushed during the year, amounting to 1,113,300 tons, represents £25,684. The fact that so small a drop in grade as .11 dwt. reduces profits to such an extent emphasises the difficulties which the manager of a large low grade property has to face to maintain his profits from month to month. To work profitably ore of a mine value of about 4 dwts. means the exercising of the greatest care and economy in all departments, so that should there be even a small temporary drop in the value, there is practically no margin for reducing working costs to set off against same. The reduced value of yield is traceable to reduced values obtained from reclamation ground, and as you will see in our engineer's report he has come to the conclusion on the results obtained from this ground during last year that as compared with previous experience it is being found now that a larger percentage of the reclamation ore being met with has to be regarded as unprofitable and left in position." I will refer again to this expression of opinion by Mr. Leslie later on.

Scarcity of Native Labour.

Secondly, reduced profits were due to shortage of native labour, especially in the first six months of the year. This shortage of native labour made it expedient to fall back on reclamation rock, which is easily and cheaply mined, to a greater extent than would otherwise have been the case. During the year as much as an average of 59 per cent. per month of the tonnage crushed came from this source, whereas if more native labour had been available this percentage would have been materially reduced, as more rock would have come from stope faces containing better values. Unfortunately when the native labour had so improved as to lead us to hope that profits would increase, the company had the misfortune to meet with a series of accidents to plant and machinery, which seriously interfered with current operations. A rope in the Robertson shaft broke, which, owing to the consequent running away of the skip—I am glad to say without injury to any employe—damaged the shaft timbers. We had a breakdown of the mill engine just at a time when the spare engine was partly dismantled for overhauling purposes and then there were considerable difficulties with the new pumping arrangements in the Lohse shaft causing delay and flooding of the lower levels of that section of the mine. All of these accidents, as I said, seriously interfered with current operations and entailed considerable expense.

Present Position.

Having dealt with operations for the past year, I will now proceed to deal with the present position of the mine. The fully developed ore reserve at the 31st of July was estimated at 2,480,000 mine tons valued at 4.2 dwts. and the partially developed ore was estimated at 200,000 tons, which, from information available, was given a value of 3.9 dwts. The position as regards ore reserves is more favourable than would appear from these figures, because there are large areas which will be reached only as stope faces are advanced. To develop these areas ahead in such a way as to justify the tonnage contained therein to be included in the ore reserves would be unnecessary and costly expenditure. I will now refer again to the extract from Mr. Leslie's report dealing with reclamation rock. Although Mr. Leslie states that, as compared with previous experience, a larger percentage of the reclamation rock being met with has to be regarded as unpayable, it must be understood that, in the future, reclamation tonnage will still continue to contribute a large percentage of the total tonnage to be dealt with from the mine, but it is difficult to form an opinion as to how far this will be the case, or how much the tonnage from this source will vary from time to time, owing to the fact that values come and go within short distances as the bastard reef, which is included under the term reclamation rock, is advanced on. In the meantime the rate of development has now been increased in order to provide reserve stope faces to be attacked in the event of any temporary set-back in the rate at which reclamation tonnage can be dealt with, and I am glad to be able to say that the mine already shows a somewhat improved position in this respect.

Sand Filling.

On the advice of the superintending engineer it has been decided to sink two boreholes on the property and erect the necessary equipment to carry on extensive sandfilling operations. The total expenditure which will be incurred on this work is estimated at about £11,000, spread over a considerable period. We are anxious to start this work as soon as possible, as not only will sandfilling operations add to the safety of the mine, but it will enable us to remove cheaply very large pillars of ore which otherwise would have to be left standing as support for the mine workings. He moved the adoption of the report and accounts. Mr. Gill seconded and the motion was carried.

Messrs. F. D. P. Chaplin and W. H. Dawe were re-elected directors; the chairman remarking that they would have seen that Mr. Chaplin had been appointed as Administrator of Rhodesia, but that they would like him to remain as chairman till he definitely severed his connection with the company. The auditors were reappointed.

THE SOUTH AFRICAN

Mining Journal,

WITH WHICH IS INCORPORATED

South African Mines, Commerce and Industries.

ESTABLISHED 1891.

VOL. XXIV., PART I. NOVEMBER 14, 1914. [No. 1207.

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NOTICE.—The postage of this issue of the *S.A. Mining Journal* is: South Africa, 1d. All other parts, 1½d.

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Notes and News.

Conserving the Native Labour Supply.

Cases multiply daily of disaffected people making statements calculated to terrorize and stampede the native workers on the mines. It is to be hoped that nothing will be left undone to bring all offenders in this respect to justice and to counteract the effect of such criminal conduct. Unfortunately the danger seldom reveals itself until the harm is actually done and a body of labourers demands repatriation. A precautionary measure to prevent the evil assuming this extreme form ought not to be difficult to devise, and such an one is even indicated, if we remember aright, in Mr. Buckle's now justly famous report

* * * *

"Air-Blasts" Again.

Like "Jack Johnsons" and "Black Marias" among the troops in France, "air-blasts" are a perennial subject of discussion wherever miners congregate. As a fact, the rock burst, so called "air-blast," only appeared prominently on these fields some six years ago and, like artificial ventilation, was enshrouded in a good deal of mystery. It is generally recognized that these pressure bursts are the result of altered strains and stresses due to large excavations and deep mining and intimately connected with faults, fault planes, and other lines of weakness. Extra pillars, unless large enough to prohibit economic mining, would not appear to stop the danger, and at times increase it to a very marked degree. The remedy is to fill and pack stopes, and to keep this filling and packing as near the stope faces as possible, to avoid stripping ore along fault planes where air blasts are occurring, and to sheathe drive and stope pillars in areas already under pressure. Perhaps some of our readers would care to give us their practical experiences on the subject.

* * * *

The Earth Tremor and the Village Main.

We are advised that the following cable has been despatched to London for publication:—"Owing to earth tremor early this morning shaft pillars and about 150 feet of vertical below No. 6 level No. 2 shaft crushed. Nos. 9 and 10 stations fallen in. Sand filled areas saved workings from what would otherwise have been serious consequences. Hope all damage repaired within ten days outside. Loss of tonnage milled this month should not exceed 10,000 tons. Further trouble not anticipated. One native injured, two missing, probably killed." Reference is made to the foregoing in our leading columns.

* * * *

Raid on Mining Companies.

The news cabled from Melbourne by Reuter to the effect that the Commonwealth Government authorised a raid on the premises of the Broken Hill Proprietary Mines, Ltd., and other mining companies in Broken Hill, South Australia, and Queensland, is of more than ordinary significance. For years past much of the products of Australian mines has been exported to Germany, and this is especially the case as far as Broken Hill is concerned. It it well known that practically all the products of several of the Broken Hill mines have been exported to Germany, and with the advent of the war, Broken Hill was the chief centre affected in Australia. In normal times the police force of this portion of New South Wales would be quite inadequate to undertake such a raid as that in question, so that it is evident that, in order to carry out the raid in question, troops had to be despatched from Adelaide—333 miles away—as there is no commercial connecting link between the two places. The object of the raid, says the cable, was to seize the books of the several companies concerned. Presumably this was done with a view to ascertaining the nature of the business now being transacted, especially as one of the principal products of the mine in question is lead—a commodity for which Germany has special preference in these times

S.A. Diamond Corporation.

The first report of the South African Diamond Corporation, Ltd., covering the period from its incorporation in May, 1913, to end June last, makes as satisfactory a showing as could be expected in the circumstances. As the directors point out, the company has unfortunately opened its career in a period of almost unparalleled depression and stagnation, not alone in South Africa but all over the world. However, advantage has been taken of this stagnation to acquire on favourable terms various interests, which the directors expect to show good returns in normal times. Even at the abnormally low prices of June 30 last the company's shareholdings showed a depreciation of less than £15,500 on a total of £243,600. After various writings off the directors are able to report a net profit for the period of £9,741. Unfortunately the outbreak of the war has put a stop to all dealings in diamonds and shares, and the directors find it impossible to forecast the effects of the European conflagration on the diamond industry, or to predict when normal conditions will return.

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Cyanide Supply in the U.S.A.

Cyanide conditions in the United States and Mexico are likely to improve rapidly, thanks in large part to the persistent efforts of Mr. Charles Butters, who has been bringing pressure to bear at Berlin to secure a lifting of the embargo on shipments, says the *Mining and Scientific Press.* He has received the following wire from the acting secretary of state, Mr. Robert Lansing: "Advices from Berlin state that the American minister was informed on the 16th instant by the director of the Gold and Silber Scheide Anstalt that export of cyanide is now permitted for America and Mexico. Imperative that no cyanide be re-exported." This means that shipments must be for *bona fide* use in the U.S.A. and Mexico. Since the German ports are still open to neutral ships and the routes through Holland and Denmark are open, there is no reason why direct importations should not be resumed. In addition, three of the fourteen sets of machinery ordered in Germany before the war for use in converting cyanamid into cyanide, are reported ready and can be gotten out. There is furthermore a large shipment of cyanide from Germany to the United States that had got as far as Antwerp when the trouble began. This may become available at any time, though it may also be diverted or destroyed. It, therefore, users will but be patient and accommodate each other a little with loans, there need be no real hardship.

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Advice for British Manufacturers.

The Officer-in-Charge of H.M. Trade Commissioner's office at Capetown mentions in connection with the competition experience from Germany in the import trade of South Africa, that it is essential that British manufacturers who are desirous of competing successfully in the South African market should realise the need for both the manufacture of cheap lines and their universal distribution throughout the Union. It is obvious that the better class articles, by which British firms have made their reputation, meet the needs of the inhabitants of urban communities alone, and are unsuited, by reason of their cost, to the needs of the rural population of the country. It is asserted that if British firms are to succeed in their endeavours to capture the competitive trade of Germany in South Africa, they must apply themselves to meeting the most minute requirements of the market, by manufacturing articles to which the public have become accustomed, irrespective of whether these requirements are in the better classes or cheaper qualities of goods. In this connection, it is urged that British manufacturers must give their customers in South Africa credit for knowing the needs of the market, and must place implicit confidence in the South African merchant when he makes known his wants with regard to quality, finish, packing, supply of catalogues, etc.

V.C.T.A.

The secretary of the V.C.T.A. writes that for the purpose of organisation, the Witwatersrand has been divided into three areas, viz.: the Eastern, Western and Central. The Central area comprises the Johannesburg Municipality, the Eastern from the boundary of the Municipality to Springs, and the Western from the Municipal boundary to Randfontein. All other branches are included in the term "Country Districts. Major F. J. Henley was appointed Executive Training Officer on the 22nd October, 1914, to supervise the training in the Central area. Colonel R. P. Macdonald, D.S.O., will supervise the training in the Eastern and Western areas. The officers of the new divisions of the organisation are as follows:—Medical Corps: Maurice Dee, F.R.C.S. (England), Director of Medical Training; telephone 261, res.; P.O. Box 1978. R. B. Farrow, honorary secretary, telephone 634; P.O. Box 4225. Signalling Corps: G. K. Chambers, O.C.; telephone 122; P.O. Box 3633. W. F. T. Harvey, honorary secretary and acting O.C. during absence of Mr. Chambers; telephones 2628 and 1287; P.O. Box 2043. Artillery Corps: Col. A. Langebrink; telephone 1474b, Dale Lace Building. Advocate Blakeway, honorary secretary, Sauer's Buildings. Motor Cycle Reserve: Otto Schuller, O.C., 15 Brown's Buildings, Johannesburg Mr. White, hon. secretary, 15 Brown's Buildings. All communications in connection with the above sections should be addressed to the honorary secretaries.

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State of Labour Market.

The state of the white labour market in South Africa is particularly interesting just now, and throws an interesting light on economic conditions. The labour report of the Department of Mines for the month of October shows a decrease of 194 in the number of applications for employment as compared with the previous month, the figures being 767 applications in October as against 961 in September. Nine municipalities in the Transvaal Province during the month of October approved plans having an estimated value of £22,166, as against £62,731 for September. In the Cape Province plans were approved at an estimated value of £21,652, while the Durban Municipality passed plans valued at £3,300. The demand for boot lasters and sheet metal workers is above the usual, but openings for skilled men in the building trades are falling off. Hopes are entertained that contracts with the P.W.D. will be considerably increased at an early date. In the Cape Peninsula a decided decline in the demand for labour, especially European skilled labour, is recorded. It is possible that special steps for the relief of unemployed during the first weeks of November will have to be taken. In the details and classified review of Rand trades it is stated that the whole of the allied building trades continues in a very dull condition. Military requirements keep some of the engineering workshops in increased activity. There is likely to be continued depression in stone-dressing, and unemployment and short time prevails in the printing trade. Trade is brisk in tent and sail making, harness and saddlery, bootmaking and coach and wagon building, and also in sheet metal working. In the leather working trades there is some difficulty in securing supplies. "Good miners are always able to find employment without difficulty." Retail trades are very dull compared with normal conditions. In the Cape Peninsula all engineering trades are now much slacker.

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Customs Returns and Mineral Exports.

The statement of trade for the Union of South Africa for the month of September, 1914, has now been issued by the Department of Customs, and reflects, in figures, the effect of war conditions. Total imports for September, 1914, were £1,809,196, as against £3,457,716 for September, 1913, or a decrease by £1,648,520 —due, of course, to the temporary dislocation of commerce and shipping. The total exports for September, 1914, were £528,537, as against £5,124,270, or a decrease by £4,595,733. Gold exports have, however, practically ceased entirely for the time, for reasons already known, the total given under this head for last September being £610, for concentrates or slags, against £3,138,532 for September, 1913. The reduction under this head does not, of course, represent a loss. The export of diamonds has fallen from £1,032,945 to £140,560, but as the diamonds are still in the ground, this also can hardly be treated as loss, though it may mean temporary inconvenience and an expense. These two items, alone, explain away over £4,000,000 of the apparent decrease in exports for the month. The figures for exports of minerals for September are certainly of interest. They read:—Asbestos (1914) £1,870, (1913) £1,663); coal (1914) £63,178, (1913) £101,604; copper (1914) £28,163, (1913) £4,032; diamonds (1914) £140,560, (1913) £1,032,945; gold (1914) £610, (1913) £3,138,532; ores (chiefly tin), (1914) £16,744, (1913) £25,554; total (1914) £251,125, (1913) £4,304,330; or a nominal decrease of £4,053,205. The seven-fold increase in the export of copper in undoubtedly satisfactory, in view of the heavy demand for this ore for war purposes. Tin, also, is a useful product in such times. A regrettable decrease is that of ostrich feathers, the export of which was only £11,788 for September, 1914, against £265,018 for September, 1913, Bark has also fallen off from £29,782 to £6,463. Hides and skins from £215,501 to £66,158. Whale oil and residue from £24,957 to £1,472. Wool from £112,852 to £16,656. The Government is, however, making advances against wool and certain other commodities, the export of which is meeting with difficulties. A gratifying feature in these exports for September is the increase under Articles of Food and Drink. These were £102,588 for September, 1914, against £26,388 for September, 1913. This was almost entirely due to increases in exports of maize or mealies, which rose from £182 to £72,834.

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Nine Months with the Randfontein Central.

The statement of expenditure and revenue of the Randfontein Central for the nine months ended 30th September, 1914, shows that 920 stamps (average) crushed 1,849,228 tons; total working costs, £1,547,566 10s. 7d.; profit, £602,720 6s. 4d.; for a total return of £2,150,286 16s. 11d. Revenue was equal to 23s. 3·07d. per ton milled; expenditure was equal to 16s. 8·85d. per ton milled; profit, 6s. 6·22d. per ton milled. Expenditure on capital account amounted to £206,001 14s. 6d. Development, driven, risen and sunk, 78,933 linear feet, and 455,576 cubic feet. Ore reserves at 31st December, 1913, 8,635,610 tons; development, January-September, 1914 (less depletion), 28,652 tons; total ore reserves at 30th September, 1914, 8,664,262 tons. Ore mined, sorted out and milled: Ore mined, January-September, 1914, 1,968,110 tons; waste rock sorted out (6·04 per cent.), 118,882 tons; milled, 1,849,228 tons. Machinery "in good order." Water supply "sufficient." Native labour: "Wastage during the quarter was in excess of the influx. The supply therefore is short of our requirements."

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Standard Bank of South Africa.

The directors of the Standard Bank of South Africa, Ltd., have declared an interim dividend of seven shillings per share, being at the rate of fourteen per cent. per annum, out of the profits for the half-year ended June 30. The statement of accounts shows deposits, current and other accounts, including profit and loss account, at £21,560,485; drafts outstanding, acceptances under credits, and endorsements on foreign bills negotiated, £1,058,381; and on the other side cash in hand stands at £3,791,562; cash at bankers and at call and short notice £2,846,059; investments in Consols, Exchequer bonds, Colonial Government and municipal and other securities, including deposits with the Union Government, £2,643,335; bills of exchange, £1,038,595; and bills discounted for and advances to customers, after making full provision for bad and doubtful debts, £12,664,701. There is a reserve fund of £2,000,000, while the notes in circulation amount to £1,069,234.

TOPICS OF THE WEEK.

"JOHNNIES'" MINES AND FINANCES.

THE twenty-fifth annual meeting of the Johannesburg Consolidated Investment Company, Ltd., held this week, was an event notable alike in the history of the Rand and of that company. The career of the "J.C.I." is, of course, intimately bound up with the history of this place, its finances and its mines. It backed its belief in the future of the Rand with its money, and its reward has been commensurate with the unparalleled growth of the place as a commercial and industrial centre. The globular figures quoted by the Chairman, Mr. John Munro, testify, as nothing else can, to the firm foundations upon which the fortunes of the company were laid, to the care and ability with which those fortunes have been guided to maturity, and to the excellence of the services rendered by the representatives responsible to the shareholders in the past and at present. Doubtless owing to the moderating influences of the war and its local effects, Mr. Munro's speech was considerably briefer than usual and was confined to a plain businesslike statement of facts.

The heads of the company are able financiers commanding the best available mining and engineering talent, and they are the last to claim any public credit for administering the affairs of the company with the nice admixture of prudence and caution tempered by enterprise that spells success in these matters. Shareholders are to be congratulated on the fact that the responsibility for conserving and safeguarding the large and ever-growing real estate interests of the company has not had the common effect of killing initiative on the part of the board. The same is even truer in regard to the mining side of the business. Here we see exemplified to a greater degree than in the case of any other Rand house, the policy of continuity in mineral production, which demands the constant and far-sighter reinforcement of interests. In the Knights with its splendid additional equipment; in the Consolidated Langlaagte which may, in fact, be regarded as a new, more modern and greater "proposition"; in the Van Ryn Deep with its brilliant initial performance; and most notable of all, in the State Mines, never more full of promise than to-day, the parent company possesses a reinforcement of strength that means even more to it than a renewal of its mining youth. Mr. Munro made it plain that so excellent had development of late been at the State Mines that nothing but the all-upsetting contingency of war had prevented the question of augmenting the reduction plant from now being ripe for immediate practical consideration.

In one respect only must this year's annual meeting of the company be described as disappointing. It lacked the rousing peroration in which Mr. Imroth was wont to round off the day's proceedings and illume the Chairman's dry cohorts of facts and figures with winged words of cheery optimism. On more than one occasion in the dark days of the Rand, Mr. Imroth's annual confession of faith and confidence has fallen like refreshing rain on the desert of our hopes. Is it that Mr. Imroth regards himself as entitled to indulge in the luxury of silence now that his anticipations in regard to the capabilities of pet propositions of his, such as the State Mines, Consolidated Langlaagte, and Van Ryn Deep, are shown to be justified? Or is it, as we suspect, that he is merely waiting till that other of his pre-occupations, the diamond industry, shows signs of convalescence and he is able to dwell without any mental reservation on the future of all the far-flung mining interests of the company? If the latter assumption be correct, the managing director of the Johannesburg Consolidated Investment Company can at any rate console himself with the reflection that the temporary eclipse of those important interests was only effected by a world cataclysm such as, assuredly, can never again be seen in our time.

WINDING ACCIDENTS IN SHAFTS.

THOUGH we are far from wishing to anticipate the findings of the enquiry, but the serious winding accident in the Driefontein section of the E.R.P.M. last Sunday, whereby several white men and natives lost their lives, we hope the result will be a tightening up in the administration of the regulations governing winding engines. The number of accidents of this sort is, unfortunately, slow to show any material diminution, and since they are of their very nature most calculated to affect the *morale* of the underground workers, the fact is particularly regrettable. Comment on the latest mishap is reserved, however, until all the facts are brought to light. Meanwhile it is noteworthy that the causes of Rand overwinds or runaways have been carefully considered by the Mines Department, and it has been found that, apart from accidents of comparatively rare occurrence caused through failure or breakage of plant, at least five distinct classes in which carelesness is wholly or mainly the cause exist. These are:—(1) Starting to lower with the reversing lever in the position for raising. (2) Changing winding from a lower to a higher level; engine-drivers forgetting the fact and watching the indicator of descending skip. (3) Changing from skip to cage, and engine-driver forgetting the fact, or driver forgetting that persons are being raised in the skip. (4) Lowering unbalanced with electric winder on counter-current, too great speed developed, or too sudden application of reverse current, failure of resistance control of rotor, tripping of switch of stator current, and failure of single brake to control runaway drum. (5) Lowering on "compression" with reversing lever against the motion, too much compression created, cage stopping too soon or descending too slowly, and driver puts reversing lever over to the other position without safeguarding the motion with the brake. During last year (1913), in the Transvaal there occurred eighty-one overwinds or runaways of the conveyance (skip, cage, or kibble) in shafts and winzes. In thirteen instances death or serious injury resulted. The total was one more than in the previous year, though the total casualties were considerably less, thirty-seven cases in comparison with fifty-seven cases. Of the eighty-one overwinds or runaways last year, thirty occurred with electric hoists and fifty-one with hoists driven by steam power. In sixteen instances the driver's certificate was suspended—the periods of suspension ranging from seven days to nine months—and in five instances the driver was also prosecuted and fined. Twenty-three official cautions were administered, followed, in two instances, by prosecution. As in the present case at the E.R.P.M., one engine-driver absconded last year after an overwind and his whereabouts could not be traced. The causes of overwinding, in the cases just considered, where the engine-driver was deemed to be blameworthy, were very similar to those evidenced in previous years, with the exception that there was a reduction in the number of accidents included under "starting to lower with the reversing lever in the position for raising." During the year 1912 there were thirty-two of these cases, while in 1913 there were only fifteen. The reduction may be due to the very general adoption of Philip's prevention (warning) device. The number of overwinds due to raising too far at the end of the hoist largely increased last year. "Driver new to engine" has been a common excuse, and it is possible that the labour unrest during 1913 was responsible for non-continuity of employment and thus for dangerous accidents. With regard to the twelve "overwinds" which were due to defect of plant, six occurred in connection with the reversing gear, two with the clutch, two with the throttle valve, one with the brakes, while in the remaining case there was a "smash up" due to a loose piston. Where steam reversing gear has failed, the overwind would not have occurred if the engine-driver had watched for a full movement of the reversing gear before opening the throttle or taking off the brakes. It will be interesting to hear under which of these heads the tragedy at the E.R.P.M. falls. In any event, we look to the mine authorities and the Mines Department to take the steps necessary to prevent its repetition as far as it is humanly possible to do so.

EARTH TREMORS. MINE SUBSIDENCES, AND SANDFILLING.

THE whole crop of associated questions of earth tremors, mine subsidences, rainfall and the need of sand filling is brought up in striking form by the subsidence at the Village Main Reef on Tuesday, of which official notice appears elsewhere. First it is noteworthy that this is not the first time the big fault at the Village Main Reef has encouraged the settlement of insufficiently supported areas. Two interesting facts in connection with the fall of last Tuesday are that it followed soon after heavy rains, and that sandfilling—of which the Village Main Reef is the pioneer on the Rand—saved the workings from serious damage. The question of local earth tremors has, of course, for some time been the subject of close scientific study. Previously to the year 1908 it had been generally considered that South Africa, from a seismological point of view, was quite a stable part of the world, earthquakes being practically unknown phenomena over this region. In that year considerable interest was aroused in seismic questions in South Africa by the occurrence over the Witwatersrand of a continued series of local tremors or small earthquake shocks. None of these tremors was of sufficient intensity to do the least amount of damage to human life or property, but their comparatively frequent occurrence raised important questions as to their origin. The fact that they appeared to be localised on the Witwatersrand naturally suggested that they might be connected in some way with the extensive mining operations carried on there, but further investigation was necesasry before any connection between the two could be established. To obtain further evidence on the question of the origin of the tremors, earthquake recorders or seismographs were established at the Observatory and also by the Mines Department. The result was given in a paper read by Mr. H. E. Wood, M.Sc., F.R.Met.S. (of the Union Observatory), last April, before the Chemical, Metallurgical and Mining Society of South Africa. He said, after quoting the evidence:—

> I am therefore, led to the following conclusions:—That the Witwatersrand tremors are semi-artificial in origin, and that the ultimate cause of them is to be found in the extraction of large amounts of rock and water from comparatively small depths beneath the surface. I imagine that the combined effects of mining and water-pumping operations, is to divide up the ground beneath the surface into small sections, which may be subdivided further by existing faults. These small sections gradually become unstable, owing to the withdrawal of their supports, and suddenly slip by small amounts into positions of greater stability. This slipping communicates a slight jar to the surrounding ground, and the effect is radiated as a single wave of small amplitude. There is no evidence to show that this happens only in one particular region of the Witwatersrand, but the localities over which the shocks are felt are found more frequently along the Central and Eastern Rand than along the Western Rand. The existing records do not indicate that the local tremors are more frequent at any particular season of the year, so that it does not appear that their occurrence is facilitated by weather changes, etc. The length of the records is, however, too short to make any definite decision on this point."

In replying to the discussion, Mr. H. E. Wood pointed out that the material on which he based his paper was entirely obtained from the records of a seismograph installed at the Observatory, and he was led to the conclusion that the origin of these earth tremors could not be entirely dissociated from the mining operations on the Witwatersrand. "It is obvious, however," he added, "that I dealt only with one side of a large question, and that my paper is really not complete until I can answer questions raised as to the synchronization of earth tremors and falls of rock in mines. I would emphasise the fact that it is not to be expected that every earth tremor will be accompanied by rock falls, and also that not every fall of rock must be the result of an earth movement. There may be falls of rock in a mine, even although the superincumbent mass may be perfectly stable, due to the disturbance of the balance of hydrostatic pressures. Owing to the kindness of the Government Mining Engineer I have been placed in possession of a large mass of material dealing with the practical side of the question, from which I hope to supplement the paper I have read before you." The publication of the promised supplement to Mr. Wood's paper will, therefore, be awaited with interest. In the meanwhile sand filling has received a valuable fillip on the Rand.

POSITION OF GLYNN'S LYDENBURG.

Development Gives Improved Results—Year's Profit, £53,925—Extension of Electric Power Plant.

THE net profit earned by Glynn's Lydenburg for the year ended July 31 amounted to £53,925 18s. 8d., to which must be added the sum of £20,320 6s. 4d., brought forward from last financial year, and £3 18s. 4d., unclaimed dividends written back, making a total of £74,250 3s. 4d., which has been dealt with as follows:—Government tax on profits, £5,343; dividends Nos. 25 and 26 (20 per cent.), £34,000; expenditure on property and mine equipment, £466; balance carried forward, £34,440. From the reports it is seen that Mill Hill, which of recent years has supplied the bulk of the ore crushed, is rapidly becoming exhausted. The company's future will depend on the results obtained from the Werf Mynpacht. Up till recently these results were not too satisfactory, but at the close of the year the acting manager reported an improvement in values in the southernmost portion of the workings, and development is now being pushed in this direction. In order to establish its water rights and power plant on a proper footing, and to carry out its undertakings to Government with regard to the supply of power to neighbouring mines, it has been found necessary to obtain from Government increased water rights, and also to extend the plant by the addition of a 300 k.w. generating set. This extension of plant is being taken in hand immediately, as also the erection of a dam in the Sabie River in connection with the necessary water supply. It is anticipated that the cost of these works will be approximately £4,000. From the acting manager's report, we take the following:—

Mill Hill.—During the year under review 84·73 per cent. of the ore mined was obtained from this hill. No. 4 section, which has for some years past yielded high grade ore, is now exhausted. The pillars in the top or eastern portion of this hill continue to yield a small tonnage of good grade ore. The greater portion of the ore reserves are in the lower or north-western section of this hill, where it is estimated there are nearly 35,000 tons.

South Hill.—During the past year 1,045 tons were mined from this section. In calculating the ore reserves no tonnage has been taken into account for this section, owing to the very patchy nature of the reef making a reliable estimate impossible. Work was commenced in May last on the lower or western portion of this hill with a view to proving the area between this and the top section of the hill; sufficient driving has not yet been done to indicate the prospects here.

Compound Hill.—No work was done on this section during the year.

Vergunning Claims.—The driving on the southern end of this block failed to locate any payable reef, and the work was suspended in November last. We are now stoping the little reef opened out on the northern end of these claims.

Werf Mynpacht.—Development work on this section shows an increase of 1,912 feet compared with last year. Water difficulties increase as we proceed south, but I am pleased to say the prospects are distinctly encouraging in this direction. The No. 2 west drive advanced 684 feet during the year, with disappointing results. The ore reserves at 31st July, 1914, for this section show an increase of 4,574 tons over the reserves at 31st July, 1913.

Prospecting Claims.—Your Company still holds the block of 150 prospecting claims adjoining the southern boundary of the werf mynpacht. An attempt was made to locate the reef with a diamond drill on the southern portion of the block. At a depth of 241 feet 5 inches the casing collapsed and the attempt was abandoned. The ground at this depth was still soft and broken. No further work has been done to prove this block, as it is evident that the reef lies at a greater depth than was at first anticipated, and is under water. In course of time the werf mynpacht drives might tap this ground. In October last an option was taken over about 147 claims on the boundary of Grootfontein and Sheba, and 1,146 feet of driving and sinking were accomplished, with poor results. The option was abandoned in May last. A rearrangement of the sands tanks was effected in the latter part of the year, and two additional tanks were put in, which has resulted in a saving in native labour, and at the same time enabled a larger tonnage to be treated. The electric power plant has been maintained in good order. The capacity of this plant is insufficient to cope with the demand for electric energy at the present time, and it is hoped that work will soon be commenced on the construction of the new dam across the Sabie River and on the new generating set. An improvement in the supply of native labour is to be noted during the period under review, and during the latter part the supply has been more than sufficient to meet our requirements. The Nelspruit-Graskop railway was opened to Sabie in November last, and stores are coming forward with more regularity than formerly. The Sabie Township has not yet been proclaimed, although approved of by the Government. Most of the streets have been made and a number of stands sold during the year. A dipping tank was erected near the township for the dipping of the township and district cattle, which is now compulsory. The plantations remain in good order. During the year poles to the value of £531 16s. 10d. were supplied for use in the mine. As the plantations had more than paid for themselves a year ago, they have shown themselves a very remunerative proposition. The rainfall for the year was 41·47 inches on 136 days, as compared with 36·19 inches on 120 days for the previous year. Notwithstanding this increase, the Sabie River is lower than last year, and the same applies to water in the top race to the mill.

THE IMPROVED VENTILATION OF THE MINES OF THE RAND.

Work of the Past Six Years Reviewed and Examined.

[By H. STUART MARTIN.]

IT is perhaps somewhat unusual when a paper has been read and discussed, that the writer's final reply should call for further discussion. However, the reply is of such a nature that it has been thought desirable to give the members a further opportunity of continuing the discussion, also in some measure to compensate for the paucity of the previous discussion complained of by Mr. Pile. Probably all agree with Mr. Pile on the importance of systematic ventilation, and that with ordinary careful study and application the most difficult mines can be properly ventilated. However, he could not agree with the author when he goes so far as to say that "the importance of systematic ventilation seems to be grasped only by a few, and so little attention has been devoted to the subject," at the same time supporting this statement by referring to some four of the largest and deepest mines, "where the ventilation is ridiculed, and miners and underground officials truthfully say that in many cases there is no ventilation at all." He (the speaker) did not propose to discuss whether ventilation of mines has an important economic aspect, as it is obvious that where there is a lack of pure air there is less energy, and the result is inefficiency in every direction. He was sure up to six years ago the attention given to mechanical ventilation was nothing like the attention given to it to-day, or during the last few years. On the other hand, it must be remembered that during the last five or six years the mines on these fields have undergone a great change, workings have increased considerably in depth, together with in many instances—particularly of the deeper and newer mines—an enormous increase in capacity, with fewer connections to the surface—so unlike the outcrop mines, with their numerous outlets from shallow workings, and comparatively small mine workings. Natural ventilation when properly handled provides ample air in many mines, although it must be admitted that there are cases where the full advantage of the means for natural ventilation is not always taken. Referring to the deeper mines, where the natural ventilation is not sufficient to provide for the proper ventilation of the mine workings, something in the form of artificial ventilation must be done. The impression obtained from Mr. Pile's reply is that this method has been sorely neglected owing to the absence of explosive gases, and to the cost of the installation and working of mechanical ventilators. He further states that: "The most recent prosecutions for contravening the regulations in this respect have revealed the grossest incompetence and neglect on the part of those responsible, and until the Government enforces to the fullest extent the systematic and proper ventilation of metalliferous mines the same slip-shod methods will obtain, and the low degree of efficiency at present existing amongst all our underground employees will remain where it is." Mr. Pile has, in his anxiety to improve matters, surely overstepped the mark and painted all the mines, and everyone concerned, with the same brush and with the blackest of paint, as the words he uses, "grossest incompetence and neglect," "slip-shod methods," and "low degree of efficiency," are, to say the least, in the nature of strong language, and those responsible, after hearing such words, must feel at least criminals of the first order. He did not feel for one moment that Mr. Pile really meant all he said. For the purpose of easing Mr. Pile's mind, the speaker referred him to the report of the Department of Mines (just issued), Section 7, under Ventilation, where it is reported that out of 65 mines

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[*] Being a contribution read before the South African Institute of Engineers o nMr. W. Pile's paper.

no less than 40 fans have been installed, and during 1913 12 fans were installed on 11 mines. This does not coincide with Mr. Pile's statement that only the few grasp the necessity for and the advantages of good systematic ventilation. Again he would refer Mr. Pile to Annexure B, Extracts from Reports of Inspectors of Mines, page 107 (Germiston Inspectorate): "*Ventilation.*—The importance of this subject cannot be minimised. It is gratifying to report that rapid strides have been made in this district with regard to ventilation. Managers and underground officials have awakened to its importance, since the subject of the prevention of miners' phthisis came to the fore. The majority of mines now have sufficient air coursing through them for efficient ventilation, but much has still to be done in practical as well as scientific coursing, splitting and distributing. There is still room for improvement in details for the proper distribution of ventilating currents underground. There are seven outcrop mines in this district, and two of them have fans installed underground to aid the natural ventilation. Of the remaining seven deeper mines, five have fans installed, and the other two contemplate such ventilation." Other gratifying remarks are also made on the subject, to which it was not necessary to refer. He noted also that Mr. Pile has so little confidence in the engineers of this field, that he suggests Dr. J. Scott Haldane should be asked to visit the Rand and explain how to ventilate the mines. He, for one, would be ashamed indeed to ask him to come—the problem is so simple. He (Mr. Martin) considered they had an abundance of brain to perfect the ventilation of the mines, if only given a little time; on the other hand, he was sure that Dr. Haldane would be delighted, if not astonished, to see how well the majority of the mines are ventilated. He would not be surprised if a few mines, not the majority, called for considerable improvement, and possibly in these cases something is being done. He ventured to think that, in summing up, Dr. Haldane would say that considerable attention has been devoted to this matter and, as compared with other metalliferous mines, these mines are well ventilated, and compare most favourably with the ventilation of the coal mines in the best coalfields of the world. He noticed that Mr. Pile objects strongly to fans being erected underground and that he only advocates the erection of fans on the surface, since he states that when placed underground they become "dust disturbers," and are in most cases "wastefully employed" and are wholly inefficient. This was, of course, merely a statement. He would be glad indeed to have some figures, or even some substantial arguments in support of this statement. He agreed that, where possible, and where the conditions were such that would allow of the same degree of efficiency, that it is always better to place the fan at the top of an upcast shaft. He (the speaker) was responsible for the erection of and placing one of the largest mechanical ventilators underground, namely, at the Village Deep, circulating approximately 300,000 cubic feet of air per minute. This corresponds to the reference made of ventilating two adjacent mines on the reef, one an outcrop and the other a deep level (mentioned by the author). He was also responsible for the erection of fans in other mines on these fields, above and below ground. The problem in the Village Deep case was to ventilate extensive deep level workings, and at the same time to improve the ventilation of the outcrop mine. Both mines were taken as one mine under the same control; it was a case of killing two birds with one stone. The conditions prevailing did not provide any one shaft with sufficient free air space to allow the quantity of air that was required; in other words, all the available upcast shafts were too small, and were not suitably placed. The three shafts of the deep level mine were necessary as downcasts, whilst the main shafts of the outcrop mine were used as upcasts. All the shafts were open to extensive workings. For this reason the fan was placed underground in the pillar dividing the two mines. It was true that all the fresh air enters the three shafts of the deep level mine, and the so-called vitiated air exhausts through the outcrop mine. It may appear at first sight that the outcrop mine is getting bad air from the deep level mine. However, arrangements were made to short-circuit sufficient unused fresh air direct to the fan and to the outcrop mine, exactly similar to the addition of fresh air splits, so that the air entering the outcrop mine greatly improved conditions as compared with the natural ventilation on which it previously depended. During blasting hours arrangements are made that the outcrop mine blasts first, in exactly the same way as blasting always takes place in the upper levels, following down against the air currents. In a very short time after blasting, both mines are clear of all smoke, and by means of a complete system of watering, there is no dust. Had the fan been placed at the top of one of the outcrop shafts, as suggested by Mr. Pile, firstly the shafts would be too small and sufficient air could not have been circulated, and secondly, the loss of air due to leakage would have made it impossible to ventilate the deeper workings. He failed to see what else could have been done to ventilate these mines efficiently, unless a new circular shaft were sunk from the surface as an upcast shaft, and this could not be justified with an outcrop mine having only a few years' life. In the ventilation of collieries, the mines are from the very outset laid out for proper ventilation. Shafts are located, and wind roads kept open, that each split of air may be directed through definite courses or ventilation splits; the whole of the area worked out, "except the necessary airways," is completely stowed. Such action is neither possible nor practicable in metalliferous mining. The introduction of sand filling does permit of dividing the mine's workings into districts, and this will facilitate the splitting of air currents. In some mines advantage can be taken of the dykes and faults as natural brattices for the better ventilation of the mines. He was averse to the introduction of too many doors, stoppings, ventilation through small pipes, etc., as they had a tendency to block the main ventilation of a mine. In a long dead end drive of sufficient size, special arrangements for ventilating the face can be made with advantage. Otherwise the ordinary development drives, well provided with water and air blasts, do not call for this extreme measure, provided the winze connections from level to level are not delayed. All winzes and raises should be made of large size, and there is no reason why they should not be driven straight. Some time ago, at a meeting of this institution, the speaker had the privilege of discussing a paper by Mr. Jourdan (Journal Vol X., No. 4), and suggested a method of advanced development that might be adopted on certain mines, which would result in improved ventilation, namely, the cone system, as against the inverted cone system, which is the ordinary practice on these fields. He did not propose taking up time in repeating the remarks he then made. Those of the members who may be interested might refer to the Journal for November, 1911, page 85, with renewed interest. Mr. Pile mentions the use of steel supports to replace timber. He had had considerable experience in the use of steel props, collars and arms, replacing timber pairs, girder arches, etc., in the Welsh collieries, and in all cases their use has only been successful on a large scale, in what may be termed dead ground, and then only in main thoroughfares. To some extent and for temporary purposes, steel props are used in the live workings following the advancing face; the use of a prop for roof support in the Welsh coalfields is entirely a temporary measure, very much more so than the use of timber props used in the mines on these fields. In coal mining (referring to "longwall working"), the prop is replaced by close packing following the line of face of workings, and most of the props are taken out and used over again, in some cases many times. If the roof is really good, steel props can be used, but under weak roofs, where it is dangerous to take the props out, too much steel is lost, and when left in the goafs it does harm. All timber props that are left behind before being gobbed should be weakened to ensure breaking them when the general weight comes, the object being to throw the weight behind on to the packs or gobbs and not on to the face of the workings. Mining men generally prefer timber to steel, as timber gives warning of crush and movement; indeed, he would not care to use entirely steel props in our stope faces under any consideration. If permanent support is wanted, then well constructed waste packs cannot be beaten. It might be of interest to state that steel girder arches are now being used on the New Modderfontein to secure a dangerous piece of ground on the main haulage drive driven in the footwall; in other places masonry sidewalls and steel girders are used with great success.

SUPERVISION.

Turning to the writer's opinion on supervision as applied to the ventilation of a mine, he states that it should be placed in proper hands, and carried out by competent persons, and then suggests that the shiftboss and the miner have no power to alter air currents. He (the speaker) maintained that the alteration of a current of air in a mine is the duty of the manager, and under-manager, or such person only who has control or supervision of the whole of the mine, otherwise a miner or shiftboss may easily improve the ventilation of his working place or district without knowing what havoc he may be doing to other portions of the mine in which he has no interest. The writer also states that inspectors of mines should have wider scope and powers. He ventured to think they have ample power. He looked upon an inspector of mines as an engineer of proven experience, who is not anxious to manage the mine he inspects. There can only be one manager—the resident man is responsible after all said and done. The inspector is the gentleman the manager looks to for advice and assistance to help him when he is in difficulty, not only who places difficulties in the way, but one who gets rid of them the friend of the manager. Regulations are made for the purpose of strengthening the manager's hands. If a manager is such a man that he must be policed by an inspector of mines before he will carry out the necessary regulations and precautions, he has no business to be there. He agreed with the author that the lay out of a mine is most important, not only with the ultimate object of proper ventilation, but for such purposes as better supervision, concentration in the handling of ore, water and labour saving. He ventured to state that the underground lay outs on these mines were second to none in the mining world. The author alludes to impure air and noxious fumes. Much could be done to eliminate noxious fumes from explosives by better detonation and the use of primers which accelerate detonation and result in complete combustion. By the use of low grade explosives and better detonation, equally as good efficiency, if not better, might be obtained as compared with the higher grade explosives, such as gelatin. Before concluding, he would point out that three large circular shafts had been sunk on the Rand chiefly for the sake of ventilation; two of which would be entirely used for this purpose. Finally, he wished to express his thanks to the author for bringing this most important and interesting subject to the notice of members.

(*To be continued.*)

Griqualand West D.M. Co.

The directors' report states:—"Your directors have much pleasure in submitting their report for the year ended 30th September, 1914, together with a statement of the affairs of the company to that date. The working agreement with De Beers Consolidated Mines, Ltd., has been satisfactorily carried out during the year, and half-yearly dividends at the rate of 4 per cent. per annum have been paid. Your directors have to report with deep regret the death, on 1st April last, of their colleague, Mr. Robert English."

SANDFILLING IN THE GOLD MINES OF THE RAND.*

History of the System—Village Main Reef the Local Pioneer—Comparative Costs at Various Mines—A Timely Reminder.

[By B. C. Gullachsen.]

The hydraulic stowing of mine workings is a subject that is coming more and more into prominence in the mining world; and although there are many detractors of the system in this country, the most conservative of British mining engineers must, by now, be convinced of its practical utility. That Great Britain should be one of the last mining countries to adopt hydraulic stowing is only in keeping with its old tradition of caution; but one cannot think that the coal mining industry of this country will hesitate much longer in adopting the system. It is not the object of this paper to deal with hydraulic stowing in general, but with the method as employed at the gold mines of the Witwatersrand in particular. In the Transvaal hydraulic stowing was first used in the gold mines about the middle of 1909, but credit is often given to the late President Kruger for having several years previously suggested that the unsightly residual sand dumps, which were then commencing to make themselves objectionable, should be conveyed underground to fill up the excavated portions of the mine. The first mine at which hydraulic stowing, or "sand-filling" as it is more generally called on the Rand, was commenced was the Village Main Reef, to be followed shortly afterwards by the Ferreira, and by June, 1910, the Village Main Reef was sending underground about 1,200 tons of sand daily. During 1911 several more mines were equipped, and in the annual report of the Central Mining and Investment Corporation for 1912 it is stated that at seven mines of this group alone 984,650 tons of sand were stowed into the worked-out stopes. At the present date fifteen mines on the Rand have installed hydraulic equipment, and more are to follow in the near future. Hydraulic stowing on the Rand may be divided into two systems—namely (1) sand taken from dumps; and (2) sand taken direct from the cyanide vats. In the first of these two systems the sand to be used for stowing is taken from the mine dump (the dump consisting of the residual sand after the gold has been extracted).

SAND-FILLING AT THE GELDENHUIS DEEP.

The sand at the dump is shovelled into trucks, which are then taken by an endless-rope haulage to the collecting bins, situated near the entrance to the mine. The sand is tipped into these bins, which are furnished with folding doors, through which the sand is able to pass when required. Projecting through these doors are short lengths of 3 inch piping, having a flat shaped nozzle end, and perforated along its length with small holes. Water under pressure is turned into this pipe, and is injected into the surrounding sand, which is then washed through the doors into the launder. In the event of the sand coming through too thickly, more water may be added in the launder from the water pipe provided for that purpose at the end of the launder. The pulp flows down the launder, which has a gradient of about 15 degrees, into a box-shaped receptable at the top of the shaft, from which box the pulp is conveyed through 6 inch cast iron pipes to its desired destination underground. At the Robinson the arrangements are different, as at this mine the dump was so conveniently situated to the mine workings that it was found unnecessary to convey the sand to storage bins. The sand is washed direct from the dumps by means of high-pressure water thrown on to it by hydraulic monitors with 3 inch nozzles, which force of water breaks into the dump and washes the sand away into launders. The pulp then proceeds direct into a small shaft, from the bottom of which the pulp is conveyed into the workings by means of launders. Unless, as in the case of the Robinson, the sand can be washed direct into the workings from the dump, this system has the disadvantage that the sand must be shovelled from the dump into trucks and then conveyed to the collecting bins, an expense not incurred by the other system. When sand from old dumps is used, considerable quantities of lime must be added in order to neutralise the sulphuric acid formed by the decomposition of the pyrites. Another disadvantage of using old dump sand is that the sand is mixed with a considerable quantity of colloidal slime, the presence of which is very objectionable underground.

SAND TAKEN DIRECT FROM CYANIDE VATS.

This system was first employed on a large scale at the Simmer and Jack, although current sand residue had previously been employed to some extent at the City and Suburban. The essential feature of this system consists of using the sand as soon as it is discharged from the cyanide vats, thus doing away with the cost of transporting it to the top of high dumps, whence, as in the first system, it has again to be shovelled into trucks and transported to the collecting bins. What was at first looked upon as a grave objection to this system was the presence in current sand residue of dangerous quantities of potassium cyanide, and it was found to be absolutely necessary to destroy the cyanide before the sand could be used. This was accomplished by introducing into the water a small amount of permanganate of potash solution, thus converting the poisonous cyanide into harmless cyanate. In this system it is a great advantage if the sand treatment vats are situated so that the sand immediately on being discharged can be mixed with water and permanganate and run direct into the mine. As frequently occurs, the vats are placed some considerable distance from the borehole or entrance to the mine, in which case, as at the Simmer and Jack installation, the pulp has to be pumped to the position where it is required. The pulp then passes through dewatering cone classifiers, the underflow from which is then discharged into the borehole or pipeline leading to the mine workings, while the overflow runs or is pumped back to the mixing bin, when it is again utilised to bring up more sand. It is interesting to note that in this system the ore hoisted from the mine about a fortnight previously is returned again minus its gold content, and that a ton of the ore which occupied a space of 12 cubic feet *in situ* in the mine yields about the same volume of sand for return underground, after the ore has been well crushed and classified into 50 per cent. sand and slime respectively.

CONVEYANCE OF SAND DOWN THE MINE.

The systems of dealing with the sand on the surface having been discussed, the next point is the lowering of it down the mine. There are two methods of doing this—namely (1) by means of pipes; and (2) by means of boreholes. In the first case the pipes are hung in the shafts, care being taken to make them quite secure, on account of the very considerable vibration caused by the passage of the thick pulp through them. The pipeline must also be easily accessible, so as to allow of the easy and rapid removal of the lengths of pipes that become worn through. A great objection to the sand filling pipelines being installed in the shaft is that, in the event of a pipe becoming worn through, or bursting, a considerable quantity of pulp is discharged into the shaft, causing a very objectionable mess. It was at first considered that boreholes would be impracticable, on account of their becoming choked, but in practice this is not the case if the borehole is of a reasonably large diameter. Boreholes 7 or 8 inches in diameter have been found to give very little trouble through choking. If a borehole should become choked, it can be cleared by running a small amount of water into it for a few hours. Boreholes have the great advantage over pipelines that after once the first cost has been met, there is no upkeep cost, as in the case of a pipe line. There is also the additional advantage that they can be put down at the very best point for the distribution of the filling material underground, thus avoiding in many cases the great lengths of more or less horizontal piping necessary when the pipeline is taken down the shaft, and which are so liable to become choked. Boreholes are in use at the Simmer and Jack and Robinson Deep; that at the Simmer and Jack was put down by means of a jumper drill at a rate of 8 feet per day, and at a cost of 17s. to 20s. per foot. The Robinson Deep borehole was bored by a steel shot drill to a depth of 1,700 feet in nine months, and cost £2,625, or a little over 30s. per foot. The borehole at the Simmer and Jack has now been in use for four years, and no trouble whatever has been experienced with it. After the stowing material has reached the bottom of the shaft or borehole, the next consideration is the method to be used for its distribution underground. For this purpose two methods are employed—namely (1) by transport under pressure in pipes, and (2) by transport in launders. Transport under pressure in pipes is necessary in all mines when the filling material has to be conveyed along roads that are either horizontal or that only slightly dip or rise, the pressure being obtained by the head of pull on the vertical pipes in the shaft. On the Rand only three kinds of pipes have been used, the ordinary cast iron pipe, wood lined pipes, and to a very small extent porcelain lined pipes. The pipeline is laid either along the foot of the drives and stopes, or when this is not practicable, the pipes are hung from the "hanging" by means of chains attached to eyebolts, or else they are supported on timber trestles. The pipes may have loose or fixed flanges, rubber (insertion) washers being placed between them. After a few months' use the pipes are given a turn, in order that the bottom segment of the pipe, where the greatest wear takes place, may be replaced by a portion of the pipe which has suffered comparatively little damage through the abrasion of the sand particles. By this means the pipes can be used for a considerable length of time. The life of the pipes used on the Rand appears to be very variable, and it is therefore difficult to give any exact figures on this point. Transport in launders is preferable to that in pipes wherever the gradient is suitable. The gradient required is dependent not merely upon the size of the sand particles and the ratio of sand to water, but also upon the volume of pulp and the roughness and internal shape of the launder. In a wooden launder, sand pulp containing 30 per cent. of moisture will flow slowly on a grade of 30 per cent. approximately 17 degrees; with 40 per cent. moisture on a 20 per cent. grade, approximately 11 degrees; and with 60 per cent. moisture on a 10 per cent. grade, approximately 6 degrees. Launders are made up of planks, the bottoms being provided with a liner of hard wood and with angle pieces of hard wood in the corners. V shaped launders are easy of construction, cheap, and being light, are useful when frequent replacement is necessary. At the Robinson launders having concrete liners were used. These were made in 3 feet lengths and placed inside the wooden launders. Drainage launders are used for carrying off the water from the surface of the filling. These launders are in box form, and must be of fairly strong construction in order to withstand the pressure of the filling material down through which they pass. Fresh lengths are added as the filling rises, each length provided with some means of escape for the water as it rises along its entire length. Either holes are drilled or the top plank is left off and short lengths nailed on as the water rises, cocoanut matting or wire netting being placed over the openings for the purpose of clearing the water.

BARRIERS.

Before filling can take place underground, the place which it is desired to fill must be prepared for the purpose. Wherever possible, faults, dykes or portions of unprofitable bodies of ore are used as natural barriers; but as in many mines these natural barriers do not exist, or as is more often the case, do not occur in that portion of the mine where they could be made use of, it is necessary to build artificial barriers. Barriers should be built with two purposes in view—first to hold the sand in the position required, and secondly, to allow of the drainage of the water. The first barriers built underground on the Rand were constructed as watertight as possible, all the water being carried off from the surface of the filling by means of special drainage launders which passed down through the sand and barriers, and were gradually lengthened as the sand was filled in. It is now found to be preferable to drain as much water as possible through the barriers, which must therefore be constructed to act as a form of filter bed. Draining the water off direct through the barriers naturally reduces the pressure upon them to a very considerable extent, with the result that they need not be of such heavy construction as previously. A barrier which has given good results, and does away entirely with the use of timber, is one built up of waste rock in the form of a pack. The outer wall is first built of large stones, and on the inside of this smaller stones are used, gradually decreasing in size until sufficient thickness of barrier has been constructed, ash being last of all thrown on. Such a barrier, if well constructed, will retain all the sand and only allow practically clear water to pass through it. Several types of timber barriers have been used, all more or less similar in construction, only differing slightly as to their method of drainage. Fig. 6 shows a barrier suitable for supporting the sides of the sandpack, and consists of props set from 4ft. to 6ft. apart, and hitched at the bottom and the top. On the inside of the props either pitchpine or blue gum planks are nailed. The top and bottom planks are scribed to the roof and floor, and hay is often used to fill up any remaining openings. Cocoanut matting may be nailed to the planks, so as to act as a filter for the escaping water. Fig. 7 shows a barrier which is intended for use in a narrow opening, such as a boxhole, and should only be used at the lowest point in the portion of ground that is to be filled. As will be seen, its object is to act as a filter bed; ash is used as the filtering medium, and the filtered water is conveyed through the stone pack by means of a 3 inch pipe.

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*From a paper read before the North of England Institute of Mining and Mechanical Engineers.

HYDRAULIC STOWING IN DEEP MINES.

When sand filling was first introduced on the Rand, it was only employed at the outcrop mines, in order to permit of the extraction of valuable pillars of rich ore which had been left as supports. As time went on, sand filling was carried on at greater depths, and in the very deep mines it is especially necessary on account of the great roof pressure. When filling takes place at a depth of from 3,000 to 4,000 feet, a heavy charge is incurred for pumping all the extra water introduced into the mine with the stowing material from this depth, as well as the extra cost for pipes due to their rapid destruction, caused by the high pressure and velocity of the pulp. In order to avoid these extra costs, a system was introduced on the Cinderella Consolidated, by which the sand was sent into the mine in a dry condition. In order to effect this, a wooden box-launder was constructed measuring 12 by 11 inches in inside cross-section. This launder was carried down the vertical shaft to the level at which the filling material was required, which was at a depth of 3,900 feet. The sand, which should not contain more than 7 per cent. of moisture, is stored in a surface bin, from which it is taken on a conveyor belt to the top of the shaft and there discharged into the launder. On reaching the bottom of the launder, it falls on to a steeply-inclined iron plate, at which point jets of water are turned into the sand, which is then carried away as a pulp either by means of pipes or by launders to wherever it may be required The great objection to this system is the difficulty of securing a constant supply of dry sand. As soon as the sand contains more than 7 per cent. of moisture, it is inclined to gradually adhere to the sides of the launder, which in times becomes choked. The launder was connected up to a Roots' blower and jets of compressed air introduced, the idea being to assist the drying of the sand and to increase the velocity of the falling stream, but this device was found to result in only a very slight improvement. The system has much in its favour, but unless some method can be devised to enable sand containing more than 7 per cent. of moisture to be used successfully, it is certain to be a failure

DRAINAGE.

The clarifying of the overflow water before pumping is a matter of some importance, as, of course, water containing only a small percentage of sand and slime is injurious to the pumps. At those mines where old dumps are being used for filling, trouble is experienced with the large quantities of slime present with the sand. Great difficulty is found in getting the slime to settle, and on this account the use of current sand residues is much to be preferred. Slime has also the additional objection that it prevents, to a considerable extent, the rapid filtration of the water, on account of its forming a more or less impervious covering on the filter bed at the barriers. All the water overflowing from the sand filling is made to pass through the catch pits and filter beds constructed in old drives or stopes. The catch pits and filter beds should always be constructed in duplicate, so that, in the event of one becoming filled up with sludge, the water may be turned into the other while the first is being cleaned out, thus preventing any stoppage. It is often found necessary to add lime to the water before pumping, on account of its having become acid, due to the decomposition of the pyrites in the sand. The lime can be conveniently added at the catch pits.

COSTS.

The cost of sand filling varies considerably at different mines, but will, no doubt, be reduced as further economies are introduced. The above costs are those incurred by four mines on the Rand, which correspond very favourably with the costs incurred by the coal mines of Upper Silesia.

COST OF SAND FILLING ON THE WITWATERSRAND.

Mine.	Period	Tons of sand lowered. Total.	Tons of sand lowered. Average per month.	Average surface cost. Per month.	Average surface cost. Per ton of sand lowered.	Average underground cost. Per month.	Average underground cost. Per ton of sand lowered.	Average total cost. Per month.	Average total cost. Per ton of sand lowered
				£ s. d.	d.	£ s. d.	d.	£ s. d.	d.
Simmer and Jack	9 months.	172,535	19,171	269 0 1	3·368	523 10 3	6·554	792 10 4	9·92
East Rand Proprietary...	Average month.	—	19,490	189 0 0	2·320	374 0 0	4·610	563 0 0	6·93
Witwatersrand Deep	12 months.	328,645	27,387	440 1 6	3·820	426 12 7	3·740	866 14 1	7·56
Robinson Deep	4 months.	103,261*	25,815	191 14 2	1·780	821 14 2	7·600	1,013 8 4	9·42

*It is interesting to note that the 103,261 tons of sand lowered at the Robinson Deep represents 98·1 per cent. of the total production of sand residue at this mine.

Safety First.

PAYING WAGES FOR KEEPING WORKING PLACE SAFE.

The Calumet and Hecla Mining Company, according to the testimony of its manager, Mr. MacNaughton, before the Congressional Committee investigating the recent mine strike, insists that each miner, whether on contract or not, shall keep his working place safe by barring off the loose hanging, and puts no limit whatever on the time thus occupied. If the miner is on contract, and has to do an unusual amount of barring down, such as to detract from the time of his contract to an appreciable extent—say, half a day or three-quarters of a day—he is allowed company time for this. If the work is such that it is impossible for one man to do it, he has the right to call in a neighbouring miner or a timberman to help him, and if such a one should be on contract, he is also recompensed by the company. The company considers it cheaper to allow unlimited time for this work rather than to run the risk of injury to an employee. As Mr. McNaughton put it, the company pays in one case wages for a shift or two and in the other compensation for an injured or killed employee, one being a matter of from three to ten dollars and the other several hundred dollars. This point of view, perhaps, is not strictly correct, since the one case is a certainty and the other at most a possibility. Nevertheless, the cost of time spent in cleaning off a back is cheap insurance against the risk of accident by a fall of ground.

City and Suburban.

The quarterly report of the directors of the City and Suburban Gold Mining and Estate Company, Ltd., shows the total expenditure to have been £86,391 14s. 7d. and the profit £60,064 9s. 1d. The revenue from gold amounted to £146,456 3s. 8d., including £811 8s. 3d., the amount of the underestimate for April, May and June in respect of the battery and £269 17s. 7d., the amount of the underestimate in respect of cyanide works in the same three months. The value of the ore milled was £1 14s. 2·148d. per ton and the total cost per ton £1 0s. 3·214d.

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THE BELGIAN MINES IN AFRICA.*

Further Details of Progress and Working Costs at Tanganyika Copper Mines.

[By ROBERT WILLIAMS.]

In order that you may clearly understand the remarks I am about to make, particularly with regard to Benguella railway finance, I will begin by giving some extracts from a letter I wrote November 4, 1902, to the Minister of Finance of the Congo State, at his request, to show to the late King Leopold, who at that date, just twelve years ago, adopted the general policy for Katanga development laid down in this letter. I have never been able to make this letter public before, but now certain developments have made it possible and necessary that I should do so: "In accordance with your request, I now place in writing the views I gave you when last in Brussels. The reports which have come to hand from my engineer, J. H. Farrell, now place beyond all doubt that we have discovered in the Kambove No. 2 and Likasye mines the richest copper mines in the world, both as regards magnitude and value per ton of ore. These, taken together with the other large mines we have discovered, will place your group and mine practically in control of the copper supply of the world when we have connected our mines by rail to the nearest point on the seacoast. Like the other great discoveries in Africa—namely, the Rand gold fields and the Kimberley diamond fields—this great copper mine is unique in that it is of such magnitude and in such form that, although far removed from the sea, the conditions of mining it, together with the high percentage of copper, will be so favourable that the saving in the mining alone will more than compensate for the cost of transport by rail to the sea, and the cost of smelting by imported coke, should no coal deposits be found, or should a pig headed policy still decline to push forward the Southern Cape railway to connect our mines with the great Wankies coal fields near the Victoria Falls on the Zambesi River. The profit that these mines will yield per ton of copper will therefore almost entirely depend on two factors: first, the cost of transport to the coast and to England; second, the cost of smelting the ore. Now both the cost of transport to England and the cost of smelting depends upon the building of a railway to export our copper and import our coal and other mining requisites at the nearest point on the coast to England. The nearest point is Benguella, and I am on the verge of signing a concession with the Portuguese Government to build a railway to connect our mines in Katanga with this port, and a guarantee of assistance, without which such a railway would be useless. The points we must agree upon are as follows: First, that you co-operate with us commercially, not as a State, in the actual cost of the railway"—that means it is not a political but an economic railway; "second, that you allow me to extend my line through your country to the mines; third, that you agree not to charge a greater rate on your railway section than is fixed on ours; fourth, that your import and export duties are agreed upon; fifth, that no duty is charged on machinery, coals, gold, copper, or other metals.

COMPARISON WITH THE RAND.

"The comparison between our discovery and, say, the Rand gold fields is that we are ready when the railway is finished to produce ore in value that would on the narrow 3ft. average Rand bed take several millions to develop in deep level shafts, tunnels, and extensive and costly mining plant, and the public is being invited, and, indeed, has readily subscribed to such mining propositions, being content to wait for upward of five, eight, and ten years until these can possibly produce dividends. Now, our proposition is at least open to the eye; it is above ground, so to speak, and can be inspected by all and sundry of the mining experts of the world who will take the trouble to look, and our only requirement in place of deep level shafts, tunnels and mining plant is our own railway, and we can get this built with an absolute certainty that such a railway will yield handsome dividends in at least as short a time as they can get down to some of the deep level Rand mines." This letter then proceeded to show that the country could produce 1,000 tons of copper per day, and gave details of probable costs with imported European coke, and further stated that by using Wankie coke and the Benguella railway route for transport to the seasoast, copper could be landed in Europe at £24 per ton (5¼c. per pound). The letter then proceeded as follows: "It is also reasonable to expect in a sandstone formation that coal will be found not far distant from our copper, and, certainly, every endeavour will be made by us to find it by boring and otherwise; but in any case it is safe to say that the Rhodesia Railway Company will find it imperative to connect with our Benguella railway in order to make its own system pay—indeed, the very mines in Northern Rhodesia which they had calculated on to make their line pay will be served by our railway at several pounds per ton cheaper than by their own line. By such an arrangement we will secrue cheap coal and coke from Wankies, which will effect an immediate saving of at least £7 per ton of copper on 20 per cent. yield and £15 per ton on 10 per cent. yield, and the Rhodesian railway system will secure the only traffic that can make that system pay. By such an arrangement, which must come sooner or later, I shall have guided the Cape-to-Cairo railway through your State, and thereby carried out my guarantee to the late Mr. Rhodes that I would 'see it through.' Such is the plan we should work on, and if my Portuguese railway concession was signed I would place the whole scheme before Mr. Chamberlain"—who was then Colonial Secretary—"and with his keen business insight I think I would have little difficulty in showing him: first, that our copper industry is to be one of the greatest, if not the greatest industry in Africa; second, that such an industry is bound to have a great bearing on the future politics of Africa as a whole; third, that if he works with me now in this railway business and assists me to get a connection with Wankies coal fields and the Rand he will greatly assist the commercial development of South and Central Africa as a whole, and will assist both your State and Portuguese Angoliland as well as our Empire, and thereby seal a friendship which is bound to have a lasting influence on the general welfare of all."

FULFILMENT OF THE PROGRAMME.

The entire programme laid down in that letter was agreed to by the late King Leopold twelve years ago. At that date the terminus of the Cape-to-Cairo railway was many miles away from Katanga, and the Benguella railway did not exist. There is hardly one thing predicted in that letter that has not been either entirely carried out or is rapidly being carried out. I was able to negotiate and finance the extension of the Cape-to-Cairo railway to the Congo frontier through the able assistance of Jean Jadot on the Belgian side and Sir Starr Jameson on the Chartered Company's side, with the result that we have not only secured cheap Wankie coal, but discovered coal of our own at Luana, which will be useful when developed. The quantities of copper we are producing are increasing steadily, and the costs are as steadily falling, and I see no reason why, with the advent of the Benguella railway, in two or three years' time the quantities should not be largely increased and the costs either largely reduced, or, what is equally important, large quantities of low-grade ore made profitable, which can never pay without the railway. The only item in the programme I laid down in 1902 which has not yet been completed, and which might have been completed some years ago if the Belgian Colonial Minister had been as energetic as the late King Leopould in these matters, is the Benguella railway. However, colonial expansion is new to the Belgians, and they have to learn, like we did ourselves, and so we have had to be patient, and I am glad to say they have now awakaned to the fact that, if they are to make the minerals and railways of Katanga a success, they must have the Benguella railway, and that quickly.

(To be continued.)

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*This address, delivered at the annual meeting of the Tanganyika Concessions, Ltd., London, July 22, in view of the importance of Belgian developments in Africa, is of so much interest that we reprint it almost in full.

Luipaardsvlei Estate.

During the month of October, 1914, this company crushed 19,203 tons, the total profit won being £3,507. The company is advertising for 100 natives for underground work.

New Kleinfontein.

The return of the New Kleinfontein Company for October is as follows:—Stamps, 200; days run, 29·389; tube bills, 4; tons milled, 53,000; gold recovered, 15,847·207 fine ozs.; net value, £66,478 6s. 9d.; profit £21,411 19s. 6d.; working costs (excluding development), 15s. 9·076d.; development to working costs, 1s. 2·998d.; total working costs, 17s. 0·074d.; capital expenditure, £1,478 2s. 8d.; maintenance expenditure upon Apex and Benoni sections, £1,313 3s. 1d.

The Sheba.

The following are the results of operations at the Sheba mine for the month of October, 1914:—Crushed 7,010 tons, yielding 2,864 ozs.; estimated profit, £3,832.

Transvaal G.M. Estates.

The following are the particulars of this company's output for the month of October, 1914:—Central Mines: Tons crushed, 13,000, yielding 8,303·857 fine ozs. Elandsdrift Mine: Tons crushed, 675, yielding 932·848 fine ozs. Vaalhoek Mine: Tons crushed, 1,550, yielding 562·413 fine ozs. Estimated value of output, £40,811; estimated profit for the month, £24,161.

UNION GEOLOGICAL SURVEY: ANOTHER YEAR'S WORK.—II.

Report by Mr. H. Kynaston, Director—Distribution of the Field-Work—Summary of Results—Good Progress Made—Further Rand Conclusions Deferred.

(4) *South-Eastern Transvaal and Natal.* -During the winter months Dr. W. A. Humphrey continued the mapping of the Pongola Valley. completed during 1912, in an easterly direction as far as the farm Wonderfontein No. 160, including a belt of country bounded on the north by the Swaziland border and on the south by the Umkuzi River. 640 square miles of area were completed. This area is formed of a basement of Older Granite and of outcrops of the Pongola Series, into which the granite is intrusive, and overlying these is found the Dwyka Conglomerate, Ecca Shales, and an occasional capping of Coal-measure Sandstones. The extreme eastern portion of the area consists of Karroo rocks, which have been let down against the Pongola Series by a fault-plane with an approximately north and south strike. The shales of the Pongola Series are very much altered by the granite near the contact. The development of the Pongola Series in the more western portion of the area is the eastern extension of the folded group of these beds described in the report for 1912, and it is noteworthy that the lower beds of this series with their associated amygdaloidal volcanic rocks do not appear from beneath the upper beds on the eastern side of the fold. Amygdaloids are found in the extreme eastern portion of the area in association with shales, but only in small inliers and for the most part covered by Dwyka and Ecca beds. The Dwyka Conglomerate, overlain by Ecca Shales, covers large areas, and in one locality large boulders of dolomite were observed in the former. The Ecco shales have been invaded by sheets of massive dolerite. Gold has been found on several farms, but nothing has been done towards proving any of the properties. During the latter part of the field-season Dr. Humphrey continued work mainly in the area south-west of Piet Retief and completed the western portion of the Piet Retief Sheet, including and area of 740 square miles. The Older Granite here follows the basin of the Assegai and Pongola Rivers, the high ground to the south and also the area between the rivers being occupied by Ecca shales and Coal-measures. Perhaps the main feature of this area is the system of huge dolerite sheets and dykes, whose outcrops cover some 200 square miles in the south-west corner of the Piet Retief District. The main sill occasionally attains a thickness of 500 feet. It forms the chief peaks of the Hlangimvula group of hills, which reach an altitude of over 8,000 feet above sea-level. Coal seams occur at altitudes varying from 4,150 feet at Annyspruit to 4,675 feet on the Elandsberg. Coal is worked at Annyspruit and a few other localities, but it no doubt occurs over an extensive area as yet untouched.

Observations in Zululand.—During the greater part or October the Director was occupied, mainly in Southern Zululand, in visiting various mineral occurrences and properties in company with Mr. Hedges, Mining Commissioner for Zululand, and Mr. J. E. Vaughan, Inspector of Mines for Natal. Useful geological observations were also made, with the assistance of local information supplied by Mr. Hedges, chiefly in connection with the older rocks, possibly in part of Witwatersrand age, and in connection with the so-called Table Mountain Sandstone. Leaving Greytown, the road was taken to Inadi, whence a visit was made to the Phoenix Mine, on the Tugela River. As one descends into the Tugela Valley, the spurs and slopes of the hills consist of the older series of basic igneous rocks, resting upon which are about 800 feet of Ecca shales, capped by outliers of Coal-measure Sandstone. The older rocks consist here mainly of a rather coarse hornblende-plagioclase rock (diorite or hornblende-gabbro), often more or less foliated and associated with hornblende, chloritic, and micaceous schists. There are occasional granitic and gneissose bands, but thel are not well exposed. At the Phoenix Mine the reef consists of several small parallel quartz veins in a country rock of highly sheared hornblende-schist, the gold being associated with the smaller quartz leaders. The ore, however, is a refractory one, being intimately associated with copper and iron pyrites. This series of basic schists evidently occupies a considerable area in the Tugela Valley, being seen again higher up at the old Golden Dove Mine, and extending down to M'fongosi and beyond, and evidently belonging to the older igneous complex of the Swaziland System. In this neighbourhood frequent outcrops of Dwyka Conglomerate and Ecca shales, lying often in deep hollows in the older schists, illustrate the great extent to which the ancient pre-Karroo land surface must have been carved out previously to the laying down of the Dwyka. Not far from the Golden Dove and on the Natal side of the Tugela a deposit of gypsum is worked. It occurs as nodules or bunches of crystals occasionally up to nearly a foot in diameter, embedded in a greyish clay, which has been proved to a depth of 15 feet. This clay occupies a sort of platform, which practically coincides with the top of the Dwyka Conglomerate. Continuing in a north-easterly direction, a fine section of the quartzites, bankets, etc., of the Insuzi Series was inspected at Edwards' workings above the Insuzi River, near N'tingwe. The beds dip here very steeply to the north and consist of quartzite, reddish phyllites, and conglomerates. There are several of the latter, small-pebbled, and of the "banket" type, up to about one foot in thickness, though usually a good deal thinner. The included pebbles are mostly of quartz, occasionally of a bluish milky variety. The whole series here is much disturbed, the general structure of tht formation in this part of the country being a series of very sharp V-shaped anticlines and synclines, while in the denuded hollows in these rocks lie horizontal patches of reddish sandstone, shales, and conglomerate, assigned to the Table Mountain Sandstone. The conglomerate is usually only found with the red sandstone, according to Mr. Hedges, when the latter rests upon or near the older quartzites. An outcrop of the Table Mountain Sandstone examined near N'tingwe shows well-bedded reddish sandstones and grits with two well-marked bands of coarse conglomerate, the lower of which is probably about 50 feet in thickness and full of rounded boulders up to about a foot in diameter. A very close resemblance is shown by these rocks to the Upper Waterberg Sandstones and Conglomerates of the Transvaal. From this neighbourhood the older quartzite and banket series is well exposed up to the upper Insuzi area, though occasionally covered by patches of Dwyka Conglomerate. The country is exceedingly broken and the folding of the beds is beautifully exposed in the deep gorges which have been cut out by the river and its tributaries. A fine syncline is thus exposed by the river a short way below the Upper Insuzi store. Three distinct "banket" beds were observed in this syncline, and in the same neighbourhood occurs a much coarser conglomerate, resembling the Elsburg type of the Witwatersrand. From this area a portion of the Insuzi Series may be followed to the neighbourhood of the N'Kandhla Magistracy, and a further development of the same series is exposed in the upper portion of the Umhlatuzi River near Cooper's store and not far from the Upper Umhlatuzi Drift, a covering of Dwyka Conglomerate occurring between the Umhlatuzi and Insuzi Valleys, and thus concealing the continuity of the underlying beds Below Cooper's store the beds are on the whole similar in general character to those comprising the lower portion of those exposed in the Insuzi Valley, though some of the bankets are decidedly coarser and all the beds appear to be more highly sheared. One of the bankets, or rather conglomerates, shows a thickness of 12 feet and carries pebbles up to 9 inches in diameter. True shales appear to be absent, the quartzites and conglomerates being separated by reddish phyllites, chloritic and sericitic schists, and the whole series has been intensely folded. From a mining point of view, the bankets are of decidedly low grade, though some carry rich patches. A short distance north of this locality there is an outcrop of banded ironstones ("calico rock"), on which there are some old native workings. The folded sedimentary belt of the Insuzi-Umhlatuzi area is of great geological interest and would well repay careful mapping, though this would need to be carried out on a fairly large scale to enable the structure to be properly worked out, together with the relations of the rocks to the granite and schist complex. The same may be said of the sedimentary series exposed in the valleys of the Buffalo and White Umfolosi Rivers, which, however, were not visited on this occasion. With regard to any correlation between these rocks and any part of the Witwatersrand System, nothing definite can be said at present, beyond the fact that there is a general resemblance in lithological characters between the two, perhaps more noticeable in some places than in others.

(*To be continued.*)

Natal Navigation Collieries.

The annual general meeting of the Natal Navigation Collieries and Estate Co., Ltd., was held at Pietermaritzburg last week, Mr. J. Townley Williams (acting chairman and managing director) presiding. The report and accounts show that the financial results of last year's operations have been satisfactory, notwithstanding some important adverse conditions. The output has decreased from 316,508 tons to 310,479 tons, owing mainly to strikes of workmen. The strike of indentured Indians last year caused a loss of output of 7,000 tons in November, and the strike of white miners in January a loss of 10,000 tons. Both strikes led to permanent increase in the wages bill. The profit has increased from £42,776 5s. 11d. to £45,602 2s. 3d. In arriving at the profit, you will notice that the following heavy items have been written off:—Balance of cost of development (pit 3), £2,290 7s. 10d.; options and drilling, £1,933 16s. 8d.; expenditure at No. 1 pit, incidental to explosion in March, 1913, £217 11s. 4d.; total, £4,441 15s. 10d. The corresponding total under these heads last year being £4,902 11s. 5d. The year's profits have been disposed of as follows:—Dividends Nos. 22 and 23, each at 3¾ per cent., £30,975; mining profits tax, £1,148 19s. 5d.; depreciation, £13,396 4s. 11d.; increase in balance of profit carried forward, £81 17s. 11d.; total, £45,602 2s. 3d.

THE OCTOBER OUTPUT IN DETAIL.

A Record for 1914—Improved Native Labour Position —Group Profits—Excellent Returns.

Total output	733,746 ozs.
Value	£3,116,754
Increase	31,576 ozs.
Value	£134,124
Witwatersrand	703,985 ozs.
Value	£2,990,337
Increase	26,922 ozs.
Value	£114,354
Outside Districts	29,761 ozs.
Value	£126,417
Increase	4,654 ozs.
Value	£19,770
Total stamps	9,854
Increase	59

The gold output for October—thirty-one days, as against thirty in September—was declared at 733,746 ozs., value **£3,116,754**, or the best yet recorded this year, the next best output being in July, when the value of the output was **£3,111,398.** The native labour position again showed a small improvement, the number of labourers employed by the W.N.L.A. and by contractors at the last day of the mouth being 170,438. In September the number was 169,619, and in August 168,831.

GROUP PROFITS.

For the years 1912, 1913 and 1914 the monthly group working profits are:—

	1912.	1913.	1914.
	£	£	£
January	811,637	*1.088,471	*861,510
February	812.946	*997,750	*798.334
March	†1,089.856	*1,098,332	*929.299
April	879,968	*1,078,040	*938.039
May	959,800	*1,087,815	*990.334
June	949.545	*1,036,257	*998.312
July	*1.021.726	*751.818	*1.015.241
August	*1,030,233	*1,008,047	*965.706
September	*1,016.622	*985,314	*988,604
October	*1,056,245	*976.652	*973,233
November	*1,040.311	*925.447	—
December	*1.107,259	*928,321	—

*Including Robinson group. †Including £201.239 gold reserves extinguished.

INDIVIDUAL RETURNS.

The following is our usual monthly table:—

THE WITWATERSRAND.

	Ounces.	Value.	Inc.	Dec.
		£	£	£
Aurora West	4.203	17.855	—	115
Bantjes Consolidated	6,870	29,182	3.003	
Brakpan Mines	18,542	78,761	4,885	—
City and Suburban	12,136	51.550	3,534	—
City Deep	21.341	90,651	4,341	—
Consolidated Langlaagte	15,595	66,243	2,464	—
Consolidated Main Reef	8.769	37.469		106
Crown Mines	61.312	260.437	12.671	
Durban Roodepoort	3,629	15,415	484	—
Durban Roodepoort Deep	8,279	35,167	—	132
East Rand Proprietary Mines	53,303	226,417		1.249
Ferreira Deep	23,205	98 563	4,094	—
Geduld Proprietary Mines	9,003	38,242	—	94
Geldenhuis Deep	14,960	63.546	3.211	
Ginsberg	4.101	17,420	862	—
Glencairn Main Reef	3 579	15.203	142	
Knight Central	7.223	30,682	1.219	—
Knights Deep	18,682	79.366	2.536	
Langlaagte Estate	15,004	63.733	3,891	
Luipaardsvlei Estate	4,829	20,512	25	—
Main Reef West	6.224	26.438	1.016	-
May Consolidated	2.150	9 123	127	—
Meyer and Charlton	8,019	34,062	1,045	—
Modderfontein B.	18,032	76,597	9.672	
New Goch	7,500	31.858	153	
New Heriot	5,567	23,647	—	255
New Kleinfontein	15,874	67.314	—	886
New Modderfontein	21,922	93.119	—	2,145
New Primrose	5.585	23.723	—	557
New Rietfontein	1,430	6,074	—	1.045
New Unified	3,295	13,996	165	—
Nourse Mines	15.180	64,481	872	
Princess Estate	6 960	29,564	1,499	
Randfontein Central	61,331	260.518	11,219	—
Robinson	21,321	90,566	2,664	-
Robinson Deep	18.349	77.941	5,755	
Roodepoort United	6,603	28,048	2,417	
Rose Deep	17,512	74,386	4,133	
Simmer and Jack	21.258	90,298	22,445	—
Simmer Deep	11.150	47,362	807	—
Spes Bona Tribute	1,124	4,774	—	255
Van Ryn Estate	11.852	50,344	2.052	
Van Ryn Deep	17,107	72.666	2,545	—
Village Main Reef	14.006	59,494	—	4.604
Village Deep	16.860	71,617	—	981
Vogelstruis Estates	3.621	15,381	998	
West Rand Central	827	3,513	—	68
West Rand Consolidated	8,269	35,124	1.932	
Witwatersrand	12.164	51.669	—	60
Witwatersrand Deep	14.437	61,324	4,128	-
Wolhuter	9.978	42.384	1,593	—
Miscellaneous producers		11.041	—	2.709

OUTSIDE DISTRICTS.

	Ounces.	Value.	Inc.	Dec.
HEIDELBERG—				
Nigel	3,776	16,040	3,076	–
Sub Nigel	2.365	10.046	1,321	—
BARBERTON—				
Sheba	2.865	12,170	107	—
Worcester Exploration	1.135	4,821	136	—
LYDENBURG—				
Ceylon Lydenburg	194	824	—	183
Glynn's Lydenburg	1,824	7,748	—	208
Transvaal Gold Mining Estates	9,699	41.199	6.206	—
KLERKSDORP—				
Quest	801	3,403	774	—
Miscellaneous producers	—	30,116	8,541	—

YEAR'S OUTPUT TO DATE.

Subjoined are the figures of the output from the beginning of the present year:—

	Ounces.	*Value.*
January	651,753	£2,768,470
February	626,261	2,660,186
March	686,801	2,917,346
April	683,877	2,904,924
May	720,229	3,059.340
June	717,926	3,049,558
July	732,485	3,111,398
August	711,918	3,024,037
September	702,170	2,982,630
October	733,746	3,116,754

Albu Group.

The following are the details of results regarding the October operations of the producing mines of the General Mining and Finance Corporation group:—

Company.	Stamps.	Tons Crushed.	Total Cost.
Aurora West	80	14,562	£13,333
Meyer and Charlton	75	14,989	13,498
New Goch	120	31,600	21,136
Roodepoort United	75	34,232	27,863
Van Ryn	140	39,400	28,263
West Rand Consolidated ...	100	30,200	27,682
	590	164,983	£132,075

Company.	Cost per Ton.	Total Revenue.	Profit.
Aurora West	18 3·7	£17,784	£4,451
Meyer and Charlton	18/ 0·1	33,751	20,253
New Goch	13/ 6·8	31,512	10,076
Roodepoort United	16/ 3·3	27,942	79
Van Ryn	14/ 4·2	50,025	21,762
West Rand Consolidated ...	18/ 3·9	34,908	7,226
		£195,922	£63,847

Rand Mines Group.

The following are the results of crushing operations of subsidiary companies for the month of October:—

Company.	No. of Stamps Running.	Tube Mills.	Tons crushed.	Estimated Working Costs per Ton.	Total Fine Ozs.	Total Estimated Profit.
Rose Deep ...	300	7	61,200	16/ 3·5	17,512	£23,763
Geldenhuis Dp..	300	7	45,500	23/ 1·6	14,960	10,196
Nourse Mines...	260	7	50,800	19/10·0	15,180	13,355
Ferreira Deep...	280	7	56,390	18/ 5·7	23,205	45,515
Crown Mines ...	660	26	199,000	15/10·1	61,312	99,896
Durban Rd. Dp.	100	3	25,470	23/ 6·9	8,279	4,708
Totals & averages	1900	57	438,360	17/11·0	140,448	£197,433

The following are the results of crushing operations of Central Mining companies for the month of October:—

Company.	No. of Stamps Running.	Tube Mills.	Tons crushed.	Estimated Working Costs per Ton.	Total Fine Ozs.	Total Estimated Profit.
Modder B. ...	96	5	41,500	15/ 7·5	18,082	£43,605
New Modder ...	180	7	52,400	14/ 8·9	21,922	53,547
City Deep ...	150	9	47,400	21/ 3·5	21,341	39,241
Village Deep ...	180	7	53,000	17/ 4·2	16,860	24,825
Village M.R. ...	160	4	35,000	16/ 8·3	14,006	29,608
Robinson	250	6	58,100	13/ 6·4	21,321	50,284
Bantjes Cons....	100	3	23,600	22/ 7·7	6,870	2,148
Totals & averages	1116	41	311,000	16/10·7	120,402	£243,258

Barnato Group.

The results of operations of the Barnato group for October are as follows:—

Mine.	Stamps.	Tons Crushed.	Revenue from Gold.
Consolidated Langlaagte ..	100	52,700	£66,242
Ginsberg	75	15,477	17,420
Glencairn	160	21,740	15,203
New Primrose	155	23,000	23,723
New Rietfontein	60	8,320	6,074
New Unified	60	13,510	13,997
Quest	35	3,691	3,404
Van Ryn Deep	80	43,440	72,667
Witwatersrand	210	43,700	51,672
October totals ...	935	225,578	£270,402
September totals ...	935	216,100	£265,088

Mine.	Total Working Costs.	Working Costs per Ton Milled.	Gross Profit including Sundry Revenue.
Consolidated Langlaagte ..	£36,196	13·736	£30,351
Ginsberg	13,556	17·518	3,998
Glencairn	12,512	11·510	2,883
New Primrose	14,507	12·614	9,516
New Rietfontein	7,183	17·268	*892
New Unified	8,849	13·099	5,218
Quest	2,513	13·615	1,016
Van Ryn Deep	32,929	15·161	10,170
Witwatersrand	29,333	13·425	24,119
October totals ...	£157,578	13·971	£116,379
September totals ...	£153,817	14·236	£114,995

* Loss.

Monthly gross profits: January, £87,277; February, £94,055; March, £104,704; April, £104,493; May, £110,139; June, £115,230; July, £118,604; August, £117,064; September, £114,995; October, £116,379.

Consolidated Gold Fields Group.

The following are particulars in regard to the outputs and profits for the month of October of the undermentioned companies of the Consolidated Gold Fields group:—

Company.	No. of Stamps.	Tube Mills.	Tons Crushed.	Gold declared, Fine Ozs.	Total Profit.
Simmer and Jack ..	320	7	77,100	18,858	£35,396
Robinson Deep ...	130	8	53,000	17,847	29,504
Knights Deep ...	400	11	103,800	18,802	18,035
Simmer Deep ...	180	9	57,500	11,822	4,003
Sub Nigel	25	1	4,890	2,365	1,506
Totals	1055	36	296,290	69,694	£88,444

The sundry revenue included in the above total declared profit is as under: Simmer and Jack, £1,800; Robinson Deep, £60; Knights Deep, £292; Simmer Deep, £493; Sub Nigel, £238; total, £2,883.

Reserve gold: Simmer and Jack, 2,900 ozs.; Robinson Deep, 1,969 ozs.; Simmer Deep, 907 ozs.; Sub Nigel, 380 ozs.; total, 6,156 ozs.

Simmer and Jack.—The increased profits are due to the abnormal average grade of underground working faces.

Goerz Group.

Results of operations of the crushing mines comprising the Goerz group for the month of October, 1914:—

Company	Stamps.	Tube Mills.	Tons Crushed.	Total Value of Output.	Total Profit.
May Consolidated ...	100	—	12,400	£9,111	£481
Princess Estate	60	5	23,000	29,494	2,054
Geduld Proprietary ...	60	5	24,200	38,150	10,210
	220	10	59,600	£76,755	£12,745

Neumann Group.

The following are particulars of the results achieved by the crushing companies of this group during last month, viz.:—

	TONS.	YIELD.	PROFIT.
Witwatersrand Deep ...	47,593	£60,099	£21,006
Wolhuter	34,600	41,553	13,053
Consolidated Main Reef...	24,780	36,577	10,583
Main Reef West	23,000	25,967	3,868
Knight Central	28,020	30,146	4,200
Total for Group ...		£194,342	£52,710

Robinson Group.

In October the Langlaagte Estate and G.M. Co. milled 51,492 tons. The total yield was 15,004 fine ozs., and the estimated profit £16,468, the profit per ton milled being 6s. 4·76d. At the Randfontein Central 226,894 tons were crushed. The estimated profit was £74,751 and the profit per ton milled 6s. 7·07d.

East Rand Proprietary Mines.

The following are the results of last month's operations at the East Rand Proprietary Mines:—820 stamps milled 173,500 tons; 53,303 ozs. fine gold recovered, valued at £221,105, including 1,817 ozs., valued at £7,639, recovered from the treatment of the accumulated slime; profit for the month, £67,783, including £6,412 profit from the treatment of accumulated slime.

Nigel G.M. Co.

The secretary advises us:—The profit for last month was £2,232. The water situation is again most acute, and unless rains fall immediately the battery must be closed down this month.

Rhodesian Section.

LATEST MINING NEWS.

Rhodesia Mines and Works Regulations—Pickstone Results—Rhodesian Prospectors' ' Association— Beira Traffic.

It is notified for public information that the Administrator of Rhodesia has been pleased to frame the subjoined regulations under the provisions of section 153 of the Mines and Minerals Ordinance. 1903:—

HEALTH AND SANITATION.

1. Except on mines where no night shifts are worked, all native labourers shall be given at least one day's rest in seven. This shall not apply to native labourers employed purely on reduction plants.

2. The resident medical officer in charge of a mine, where such an officer is employed, shall examine all native labourers employed thereon, whether sick or healthy, at least once in every fourteen days.

3. The medical officer, whether resident or visiting, shall render monthly a return of all sick employees on the mine during the preceding month, whether in hospital or not, the nature of the illness and the result, accompanied by a report on the general health and sanitation of the mine, and the provision for supplying drinking water underground. This report shall be forwarded through the mine manager to the chief compound inspector or such other official as the Administrator may from time to time direct.

4. Compound managers shall be responsible, under the mine manager or other person in charge, for the supervision and control of all natives in the mine compounds, and shall take steps for procuring immediate treatment of all cases of sickness coming to their notice.

5. On every mine employing 750 natives or upwards there shall be an assistant compound manager.

6 The manager or other person charged with the management of a mine shall be responsible for the observance of these regulations, and on a breach of the same shall be liable to a fine not exceeding £20, and in default of payment to imprisonment, with or without hard labour, for a period not exceeding three months.

Section 11 of the regulations published under Government Notice No. 350 of 1911 is hereby amended by the addition of the following sub-section: —"(3) On failure by the person responsible to provide sufficiently for the accommodation and treatment of the sick, as in this regulation provided, or if it appears that no provision for the efficient treatment of any special case of sickness exists, a medical or compound inspector may, at his discretion, order the removal of sick persons affected for treatment to the nearest hospital. The cost of such removal and subsequent treatment shall be borne by the person responsible for the care of such persons, but payment thereof shall not exempt him from any liability for failure to comply with these regulations."

* * * *

The report of the manager of the Pickstone Gold Mines for the month of September contains the following:—An encouraging feature is the continued promising values in the portions of the wide reefs exposed in the drives of the second level in Pickstone West. A cross-cut put in to connect No. 1 west drive with No. 2 west drive showed reef 12 ft. 2 in. wide, giving an average of 10·3 dwts. over the total width. Owing to the continued decrease in the water supply, the gravity stamps were only able to run about 14 hours daily. No expenditure for the month was charged to capital account. The sum of £209 13s. 11d. was, however, spent on development, which, in accordance with our practice, has been charged against revenue in current expenses. The expenses for the month, including the above-mentioned sum of £209 13s. 11d., amounted to £2,615 0s. 10d., leaving a profit of £9 9s. 8d.

* * * *

A meeting of the Rhodesian Prospectors' Association was held at Shagari on November 2. The President pointed out the advisability of deputing two of their members, now proceeding to London, to confer with the directors of the British South Africa Company and to put before them the resolution adopted by the Association, and with the approval of the meeting he proposed to give them written instructions so to do. The President said: "The mining laws up to now have been drafted to meet the requirements of companies and small workers, which is purely on account of the prospector not having an association to voice and protect his interests. I have only to point out that recently the small workers got an exemption of royalty up to £200, instead of £100 as heretofore. Had the prospectors been consulted on this matter they would have advocated a clause exempting the prospector from paying royalties on trial crushings. It is palpably unfair and bad policy to treat the prospector on the same lines as the producing mines having a monthly output, as the trial crushing would probably represent the ore of anything from six to twelve months' development work. He requires to realise on the ore developed to give him further capital to do more development work or to reimburse himself as far as possible for the capital expended should the mine have proved a failure, which, unluckily, frequently happens. This is an instance in which the Small Workers' Association has failed to represent our interests and really cannot be expected to do so. This should make you all realise the necessity of upholding and giving your active support to this Association, and I would like to point out that each member should consider it his duty to try and recruit fellow prospectors for the Association, and also to attend every meeting. As it is the duty of those unable to go and fight for our country to do their utmost to better the position for the future welfare of the community, this can only be done by the individual taking an active and intelligent part in amending the laws where necessary, so that when our warriors return they will have a better and a sounder basis to start on in making a comfortable and prosperous livelihood, and that they will realise that we have also done something to advance the welfare of our country."

The following resolution was proposed by Mr. T. F. Siggins: "That a limited liability company be formed by the members of this Association, and that the British South Africa Company be requested to furnish the capital to develop the claims, the latter to be valued by two engineers, a bond for that amount being given to the company as security for the sum expended on development." This was seconded by Mr. A. F. Johnston. Upon being put to the meeting, a lively discussion ensued, it being generally considered that the present time was not suitable for such a scheme, and the resolution was defeated by a large majority.

* * * *

The thirteenth ordinary general meeting of the Beira Railway Company, Ltd., was held recently in London, Mr. Rochfort Maguire (chairman of the company) presiding. The Chairman, in moving the adoption of the report and accounts, said that the year 1912 13 was one of great prosperity for the railway, but the improvement was due to the large imports of mining machinery and construction material. The gross revenue of the Beira Salisbury section for the year ended 30th September last was £635,352, as compared with £513,139, showing an increase of £122,212. On the other hand, the working expenses increased by £18,281. He thought that he need not trouble the shareholders with general remarks as to how war handicapped trade or how the destruction of capital now going on in Europe would make it more difficult and expensive to obtain capital for new countries. Those and other general considerations of which they were feeling, and would feel, the effect he would pass by and treat only of this company's particular affairs. Their traffic had so far not been so much affected as one might have expected, although naturally a general slackening off was reported, and they must expect a considerably diminished business. On the other hand, in the early days of the war supplies were laid in for considerable periods in various quarters which might have given their traffic about the time was was declared a spurious activity. On the whole, it was too soon to say what their normal traffics were likely to be during the war. Every effort was being made to keep every existing industry possible going in the territories served by the railway system of which their company formed a part. He hoped and believed that those efforts would meet with considerable success. Meanwhile, instructions had been given to keep down and check expenditure. It was by making things as easy as they legitimately could for customers and by keeping down expenditure as far as possible that they hoped to carry the railways through the present difficult times. The resolution was carried.

Rezende Mines.

The results of operations at the Rezende Mines for the month of October, 1914, were as follows:—Estimated profit. Central Section, £2,209; Old West Workings and Penhalonga Sections, £833; total, £3,042.

Dr. Charles P. Steinmetz is credited with the prediction that within ten years there will be in operation not fewer than 1,000,000 moderate priced electric vehicles, the approximate price of which will not exceed £100, with a speed certain to average 20 miles per hour. Against the petrol cars, he claims the disadvantages of fuel and oil costs, the concentration necessary in driving a high-powered machine, and the need of constant attention to its engine.

Engineering Notes and News.

THE RAND'S LARGEST WINDING ENGINES.

Particulars of Some Electric Winders of Record Size Now in Use.

The following table gives particulars of the largest electrically driven winding engines on the Rand. It was prepared by the S.A. Institute of Electric Engineers for the Association for the Advancement of Science:—

Name of Mine.	Name of Supplier.	Type of Winder.	No. of Winder Motors.	H.P. of Winder Motors (continuous. rating).	Maximum Depth of Wind.	Weight of Rock per Wind.	No. of complete trips per hour.	Voltage of Winder Motors.	Speed of Winder Motors.
Crown Mines, Ltd.	Electrical—G.E.C. of America (S.A. Gen. Elec. Co.) Mechanical—Fraser & Chalmers, Erith. Eng.	Ward-Leonard. Cylindro-conical Drums.	2	2,00 H.P. each motor.	3,540 feet vertical.	8 tons.	44	1,000 v. across 2 motors in series	53·5 R.P.M.
Crown Mines, Ltd.	Motor Generators—Siemens. Winder Motors—A.E.G. Mechanical—Fraser & Chalmers, Erith, Eng.	2 Ward-Leonard Winders Cylindro-conical Drums.	4 (2 on each winder).	1,420 H.P. each motor.	2,260 feet vertical.	8 tons.	45	1,000 v. across 2 motors in series.	53·5 R.P.M.
E.R.P.M. Hercules Shaft.	Messrs. The British Westinghouse Electric & Manufact'g Co., Ltd.	Ward-Leonard Cylindro-conical Drums.	2	750 H.P. each motor.	4,500 feet vertical.	8 tons.	20	1,000 v. across 2 motors in series.	33·3 R.P.M.
Village Deep, Ltd. and City Deep, Ltd. (6 similar equipments).	Messrs. The British Westinghouse Electric & Manufact'g Co., Ltd.	3-Phase Motors direct-coupled. (2 Cylindrical Drum Hoists. 4 Whiting Hoists)	1	1,600 H.P.	3,600 feet vertical.	5 tons.	32	2,000 v.—3-phase—50 cycles per second.	100 R.P.M.
Bantjes Consolidated Mines, Ltd.	Messrs. Siemens, Ltd.	3-Phase Motor, geared to Cylindrical Drums.	1	1,470 H.P.	4,000 feet incline.	5 tons.	23	2,000 v.—3-phase—50 cycles per second.	250 R.P.M.
Consolidated Langlaagte G.M. Co., Ltd. (2 similar equipments).	Messrs. Siemens, Ltd.	Ward-Leonard	1	1,290 H.P.	Compound Shaft. 1,230 feet vertical and bend 3,000 ft. incline.	5 tons.	23	500 v. direct current across. winding. motor.	80 R.P.M.
New Modderfontein G.M. Co., Ltd.	Messrs. A.E.G. Electrical Co. of S.A., Ltd.	3-Phase Motor, direct-coupled to Cylindrical Drums.	1	1,200 H.P.	2,000 ft.	3 tons.	45	2,000 v.—3-phase—50 cycles per second.	

According to the *Power User*, at a recent gathering of machine tool builders in America it was stated that it cost £7 to engage a workman, test him and discharge him for inefficiency. This figure is based on the records of a large manufacturing plant, and it is easy to see how much can be lost per annum in a big works if great care is not exercised in selecting the new hands. Our contemporary points out that it is even more necessary to be careful in putting new men on a power plant staff, since an incompetent man may cause damage running into hundreds of pounds in a very short time. The quality of the work done by a mechanic or machine operative can be very quickly gauged, but it is not so easy to estimate the abilities of a shift engineer unless he blunders right at the start. A keen chief will, of course, get to know the calibre of his man before very long, but an emergency may occur, and the mischief may be done before the discovery of incompetence has been made.

Dr. Wagner, author of the "Diamond Mines of South Africa," is reported to be a prisoner in the Capital of German South-West.

MINING EXAMINATIONS.

Private Individual Tuition for Mine Managers, Mine Captains, Mine Surveyors, Mechanical and Electrical Engineers, and Engine Drivers' Examinations. Practical Mathematics and Electrotechnics, Correspondence Lessons where personal tuition is impossible.
E. J. MOYNIHAN, Consulting Engineer, 35 and 36, Cuthbert's Buildings, Eloff Street, Johannesburg, P.O. Box 2061.

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WORKS:
VENTERSBURG ROAD, O.F.S.

TEST OF THE LARGEST AIR COMPRESSOR.*

[By G. M. Clark (Member), M.Inst.C.E.]

The official test of the largest turbo-compressor hitherto constructed marks an epoch in the history of the design of such machines, and is therefore worthy of a fuller description than would generally be accorded to a taking-over test between a contractor and a purchaser. The machine is used for delivering compressed air to the mines belonging to the Rand Mines, Limited. Air is delivered through a network of pipes 30 miles in length and varying in diameter from 27½ inches downwards to 20 points of supply at a pressure of 100 to 110 pounds per square inch gauge pressure. The total capacity of these pipes is nearly 90 tons (of 2,000 pounds) of air, and the power installed to drive the compressors is nearly 60,000 K.W. The machine runs at 3,000 revolutions per minute, and is rated at 7,000 K.W. on the turbine, and is one of three similar machines installed under the same contract. The machine has an overall length of 56 feet. The low-pressure stage is next to the turbine, and is double ended. The air at atmospheric pressure is taken in at each end, and is discharged by a duct at the centre. This automatically balances the end thrust on this stage. From the first stage the air passes through the first intercooler, then through the second or intermediate stage, and then through the second intercooler, and, finally, through the high-pressure stage. All stages are water-jacketed, and water also circulates through the diaphragms. Compressed air contains no more energy than the same volume of uncompressed air at the same temperature, so that all the work done in compression has to appear in the cooling water. The compression that takes place in the first stage is from atmospheric pressure to about 0·8 atmospheres above, whilst the second stage raises the pressure to nearly 3·0 atmospheres, and the final stage to 9 atmospheres gauge pressure. The temperature of the air entering the compressor is nearly 20°C., with a rise to 80°C. at the end of the first stage. It is again cooled to 30°C. in the intercooler with circulating water at 20°C., and leaves this stage at about 100°C., after which it is again cooled to 35°C. in the second intercooler, and finally rises to 90°C. in the high-pressure stage. The isothermal compression is completed by the final cooling in the pipe line distribution system to the original atmospheric temperature of 20°C. These temperatures and pressures vary with the load on the machine, but the above statement is nearly accurate for the full load of the machine.

* * * *

The tests that were carried out in August, 1914, on the 5,000 air-kilowatt generator were officially for the purpose of deciding whether the guarantees were fulfilled, and subordinately for the purpose of giving information to the operating staff as to the behaviour of the machine. The Power Company does not sell air in terms of air-kilowatt hours as defined above, but in terms of air units, which are defined as 64·1 per cent. of an air kilowatt hour. This fraction was introduced so that the selling price of an air unit and of an electric unit might be the same. It would have been as simple to have sold air by the air-kilowatt hour and made the price of each 100/64·1 of the price of an electric unit. This air unit is introduced into a part of the subsequent calculations and represents approximately what the machine would have done had an electric generator been attached to the turbine instead of a compressor. The figures derived from air units will thus be more familiar to electrical engineers than those derived from the air kilowatt. Though the method of testing and calculation had already been agreed and accepted, these tests are of such interest, and the results are of so great importance, that other methods of calculation have been used, and it is gratifying to know that the guarantees are fulfilled independently of the method of calculation.

* * * *

The conclusions to be derived from this report on the tests is that, whilst a very great advance has been made in the size of turbo-compressors, this advance has been accompanied by another great advance in the science of design, so that the efficiency is now at least 10 per cent. above that of machines previously constructed by the same designers. From the figures given it is probable that three-quarters of the energy of the steam is convertible into mechanical work on the shaft of the turbine, and of the work on the shaft two thirds can be utilised in the isothermal compression of air with a compression ratio of nearly 12. Thus on the whole there has been an increase from a conversion of little more than 40 per cent. of the steam energy to practically 50 per cent. The report incidentally shows that the orifice method of measuring air and water is capable of being used with an accuracy equivalent to the commercial accuracy of electrical measurements. There is no doubt that measurements taken in this way are so accurate that to allow a tolerance of 2½ per cent. for accuracy of measurements is altogether too great. The report shows the facility with which steam measurements may be handled when the notion of the steam kilowatt is introduced, and the use of the Mollier diagram when converted to read steam energy directly in kilowatt hours per pound of steam gives immensely increased power of thought in all questions of turbine economy as compared with the use of ordinary steam tables.

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*From paper read before the S.A.I. of E., from the secretary of which the detailed results of the test may be obtained.

Finance, Commerce, and Industries.

Johannesburg Municipal Statistics. A great slump in the estimated returns of the erection of buildings in Johannesburg is disclosed in the Municipal statistics for October, issued this week. Last month the cost was only £15,318. In October, 1913, it was £72,751. The following figures show the variations for the last twelve months:—1913: November, £87,055; December, £68,008; 1914: January, £66,482; February, £52,997; March, £73,329; April, £56,435; May, £75,988; June, £66,774; July, £59,825; August, £81,713; September, £82,898; October, £15,318. In the electrical department 1,418,723 units were generated for lighting and power, and 629,882 for traction, compared with 1,426,355 and 592,415 for the previous month. Of gas 3,274,494 cubic feet were produced, compared with 3,334,348 for September. Compared with October last year there is a drop of about 100,000 feet in gas, and an increase of just upon 150,000 units of electricity for lighting and power. The revenue earned by the Municipal Tramways for last month was £28,703, compared with £29,184 for October last year.

* * * *

Cable Messages. With regard to the restrictive conditions imposed on cablegrams, the Acting Postmaster-General notified that as from the 23rd September cablegrams will be counted and charged for on the basis of ten letters to the word, odd fractions preceding groups of figures or commercial symbols or at the end of the message being counted as one word; thus a telegram containing the words "I will arrive home on 10th October," which ordinarily would be charged as seven words, will be counted as four words, thus: "I will arriv/e home on/ 10th October." The Postmaster-General states that the concession has been introduced as a temporary measure to alleviate the position created by the prohibition of the use of code language and the discontinuance of the Week-end and Deferred cable systems, and it is hoped that the public will find, as a result, that the cost of their cable service has been materially reduced.

* * * *

Maize Market and the War. The Reuter South African Press Agency has received a communication from Mr. Joseph Burtt Davy, F.L.S., F.R.G.S., F.R.H.S., Botanist, Agricultural Supply Association, Ltd., which has the following, *inter alia*:—The present European war is likely to have an effect on the maize market which is worth consideration now that the planting season is upon us. Everything points to their being a large demand for maize in Europe, next year, for feeding stock, because of the probable reduction in the European area under crop to maize, barley, oats, hay, roots, etc., and to the destruction of part of the crops planted owing to the ravages of war. It is also probable that these factors will help to maintain high prices. Europe's need is our opportunity, and now is our chance to plant for an assured market. It is our plain duty to ourselves and to South Africa to show what we can do in the way of maize and wheat production. Every acre that we can plough should be planted. The American farmer is alive to the same possibility; he is going to plant a big acreage in anticipation, but as the South African crop comes in some six months ahead of the American we have the advantage.

The Case for an Industrial Bank. Under the heading "Wake up, Bankers!" the *Daily Chronicle* recently published some interesting expressions of opinion by merchants on the assistance which British trade and industry requires from the banks, or failing that the necessity which exists for the establishment of an institution devoted solely to that purpose. From an interview with a gentleman who is described as "one who knows Germany as well as he knows England" we extract the following:—We can adopt German methods and create in this country the foundations of an expanding internal trade which has, up to now, been cramped by German competition and by the lack of encouragement from bankers and financiers to British enterprise. The banks have got to be stirred up and the manufacturers have got to be moved to greater energy. If traders are to replace with English goods those which have previously been bought in Germany then they must have facilities, and if the joint stock banks are too nervous, then there must be a Government Commercial Department to meet the situation. German trade can be replaced if proper facilities are granted. The point arises how this object can be achieved and this again raises the question as to whether the joint stock banks have assisted enterprise to the full extent of their power, and whether the absorption of private banks has or has not impeded business development. The banks say they have given all facilities and many traders say the contrary. It would be necessary to examine many accounts before a decision could be given on the matter, but the fact is that the joint stock banks will have to assist to their fullest extent the internal new development of the country or face State competition.

Transvaal and Delagoa Bay Investment COMPANY, LTD.

(Incorporated in the Transvaal.)

NOTICE is hereby given that the Ordinary Annual General Meeting of the Company will be held in the Board Room, Exploration Buildings, Johannesburg, on TUESDAY, the 24th day of NOVEMBER, 1914, at 4 p.m. precisely, for the following purposes:—

1. To receive and consider the Balance Sheet and Profit and Loss Account for the year ended 31st August, 1914, and Reports of the Directors and Auditors.
2. To declare a Dividend.
3. To elect Directors in the place of those who retire in accordance with the provisions of the Articles of Association.
4. To appoint Auditors for the ensuing year, to fix their remuneration and to transact the ordinary general business of the Company to be dealt with at such Meeting.

The Transfer Books of the Company will be closed from the 18th November to the 24th November, 1914, both days inclusive.

Holders of Bearer Shares who desire to attend or vote at the Meeting must deposit their Warrants at the Head Office of the Company, in Johannesburg, at least 24 hours before the time appointed for the Meeting, or at the London Office not later than the 29th October, 1914.

By Order of the Board,

B. MOSES,
Secretary.

The Transvaal Gold Fields Building,
Fraser Street, Johannesburg.
13th November, 1914.

38921

New Bacon Factory at Salisbury.

The new bacon factory, which has been erected by the B.S.A. Company in continuance of their policy of promoting local industries, should lead to the creation of a pork and bacon industry on sound lines. Of course, everything will depend upon the support which the farmers are prepared to give to the factory and the manner in which the products of the factory are appreciated by the public. Since, however, it seems to have been established that the bacon produced in Rhodesia is a choice and appetising article and compares most favourably with the imported article, there should be little doubt concerning the ultimate success of the factory and the industry.

* * * *

Openings for British Manufactures.

The office of H.M. Trade Commissioner for South Africa notifies that the following inquiries have been received from firms in the Union: A Durban firm asks for the names of United Kingdom manufacturers of portable railway plant, such as light rails, fittings, tip trucks, cane wagons, etc., for which there is a good demand upon the sugar and wattle plantations and in the mines of Natal. A trader in Capetown wishes to secure the agency of a United Kingdom manufacturer of ribbed underwear. The inquirer states that he would be in a position to carry out successfully any business placed in his hands. A manufacturers' agent in Durban, having an organisation covering the whole of South Africa, wishes to get into communication with United Kingdom manufacturers of the following goods which he has previously obtained from Germany: Cotton blankets (white and jaspe), rugs, travelling shawls, Kafir blankets, prints (*blaudrucks*), enamelware, crockery, glassware, toys, Kafir mirrors, cutlery, condensed milk, and dress goods. United Kingdom manufacturers of the goods mentioned may obtain the names and addresses of the inquirers on application to the Commercial Intelligence Branch of the Board of Trade, 73, Basinghall Street, London, E.C., but they should address any further inquiries to H.M. Trade Commissioner for South Africa, P.O. Box 1346, Capetown.

The Treasury notifies that Proclamation No. 228 of 1914 in the *Government Gazette Extraordinary* of 21st inst., prohibiting the export of wool from South Africa except to consignees in the United Kingdom was published under a misapprehension and the Proclamation is now withdrawn.

Betsiriry Proprietary Oil Fields.

Dr. J. McClelland Henderson, Ph.D., F.G.S., M.E., M.I.M.M., M.A.I.M.E., the well-known oil expert, sailed for Madagascar direct on Wednesday last, to take charge of the drilling operations for the Betsiriry Proprietary Oil Fields, Ltd., in that island. He was accompanied by two capable drillers, Messrs. Gilkey and Marshall. Dr. Henderson spent a week in Johannesburg en route for Madagascar, and expressed himself optimistically about the prospects of finding oil in payable quantities on the island after having perused reports of work done since he visited Madagascar some five years ago. It is hoped that drilling operations will be well forward before the end of this year.

The list of certificates issued by the Mines Department for the period 23rd October, 1914, to 6th November, 1914, is as follows:—Mechanical Engineers' Certificates: "Mines": J. H. Veasey, B. Pool, R. A. Robertson. Mine Surveyors' Certificates: T. A. Chitham.

Companies Registered.

The following is a list of companies registered during October:

Mayfair Tinworks and Trunk Factory, Ltd., No. 15 [illegible] Buildings, corner Market and Harrison Streets, Johannesburg; capital £1,000; private company.

Standerton Real Estate Company, Erf No. 116, Burger Street, Standerton; capital £500; unlimited.

Union Produce and Milling Company, Ltd., 471 Church Street East, Pretoria; capital £15,000; private company.

The People's Cash Butchery, Ltd., corner Anderson and Von Wielligh Streets, Johannesburg; capital £500; private company.

The Transvaal Trading Agency, Ltd., No. 2 Permanent Buildings, Harrison Street, Johannesburg; capital £1[illegible]; private company.

The Medical Journal of South Africa, Ltd., 94 Ray Street, Turffontein; capital £126.

The Diamond Cycle and Motor Works, Ltd., portion of Erf 124, King Edward Street, Potchefstroom; capital £5,000; private company.

The Union Pharmacy, Ltd., 223 Prinsloo Street, Pretoria; capital £100; private company.

Scott's, Ltd., 293 Church Street, Pretoria; capital £300; private company.

Anglo-German Exploration Company, Ltd., care William Godfrey Froude, of Malidyke Mine, Pilgrims Rest; capital £100,000.

South African Newspapers, Ltd. New name of company: Argus South African Newspapers, Ltd., Johannesburg.

B. Cumes & Rifkind, Ltd. New name of company: B. Cumes, Ltd.

INCREASES OF CAPITAL.

Modderfontein Deep Levels, Ltd., Johannesburg, increased from £395,302 to £455,000.

The Pretoria Detinning Company, Ltd., Pretoria, increased from £1,000 to £3,000.

IN LIQUIDATION.

The Taylor-Coryell Madagascar Petroleum Syndicate, Ltd., Johannesburg.

Arcadia Tea Rooms, Ltd., Krugersdorp.

Amphitheatre Buildings Company, Ltd., Johannesburg.

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The Week's Company Meetings.

JOHNNIES.

A GENERAL REVIEW.

The annual general meeting of shareholders in the Johannesburg Consolidated Investment Company, Limited, was held this week in the board-room, Consolidated Building. Mr. John Munro presided, and those present included Messrs. Gustav Imroth, Charles Marx, J. Emrys Evans, C.M.G., P. Richardson, H. A. Rogers, E. Brayshaw, Senator S. Marks, S. C. Breck, A. Spranz, J. P. O'Reilly, G. C. Fitzpatrick, C. Aburrow, F. Hilner, J. F. Rutherford, W. S. Webber, G. M. Pemberton, J. H. L. Manisty, James Neilson, H. Hains, R. M. Connolly, Professor Lawn, consulting engineer, C. A. Wentzel, solicitor, and W. H. Mudall, secretary.

Chairman's Speech.

The Chairman said: Gentlemen,—The directors' report and balance sheet for the financial year ended the 30th of June, 1914, were published and circulated among shareholders on the 23rd of September, a fortnight later than last year, and consequently the date of this meeting had to be similarly deferred. This delay was occasioned by the temporary disturbance of the mail service due to circumstances with which you are all familiar. The report was originally framed in July last, but at a later date, in view of the financial position existing in England, it was thought advisable to add an addendum thereto notifying the postponement of the payment of the dividend declared on the 20th of June last. The reasons for this postponement are fully set forth in the addendum and I can assure you, gentlemen, that the decision to postpone payment was only reluctantly arrived at after the most careful consideration of the general financial position then obtaining in England. At the same time your directors thought it would be more satisfactory to issue the report as originally framed in order to reassure shareholders as to the financial stability of the company. I am pleased to be able to state that towards the end of October the financial position had so much improved that your directors decided to pay the dividend on the 5th of this month. The period covered by the accounts has, as stated in your directors' report, been one of almost continuous and acute market depression and the statement of accounts submitted to you to-day may, therefore, be considered entirely satisfactory. Sufficient profit has been earned during the financial year to provide for all bad and doubtful debts, for a heavy depreciation on certain of our shareholdings, and the payment of a 5 per cent dividend; while an increase in the amount carried forward of approximately £2,000 is recorded.

Epoch in Company's History.

Gentlemen, I must confess that I have looked forward with considerable pleasure to presiding at your meeting to-day, as it marks an epoch in the history of the company. The original articles of association were registered on the 28th of September, 1889, therefore the 28th September this year was the twenty-fifth anniversary of the formation of your company. I have before me the first report of the board of directors for the nine months ended the 30th of June, 1890. This company then had a capital of £175,000, a reserve fund of £10,000, and assets of a book value of £253,000. To-day you have a capital of £3,950,000, a reserve fund of £250,000, and assets of a book value of £5,042,000, and of an approximate market value at the 30th of June, 1914, of over £6,000,000. A few further comparative figures indicating the growth of your company may not be without interest. In 1890 the book value of your assets showed a surplus over your capital of £78,000. At the 30th of June last the surplus was £1,092,000. In 1890 your investments in real estate and buildings stood at £120,000, with a revenue of £3,575. To-day your real estate and buildings stand in the books at £651,000, bringing in a revenue of over £60,000 per annum. In 1890 your investments in stocks and shares were confined to three companies and represented £19,000. At the 30th of June, 1914, we were interested in over fifty companies, representing an investment of approximately £3,222,000. During these twenty-five years dividends totalling 162½ per cent. have been paid by your company, which has meant a distribution of £3,637,469 in dividends to the shareholders. It may also interest you to know that in our company we have over 26,000 individual shareholders, 20,000 of whom own one hundred or less shares each. Gentlemen, I think you will agree with me that these figures constitute a worthy record of the steady progress achieved extending over the twenty-five years of our existence.

In the past quarter of a century, South Africa, and especially Johannesburg, in which you are more particularly interested, has seen many changes and suffered many vicissitudes. Many of the old faces so well known to us in connection with your company are, alas, missing. Companies have come and gone, but through peace and war, boom times and slumps the Johannesburg Consolidated Investment Company has continued on its way, carefully husbanding its resources and steadily strengthening its position till it has achieved the result reflected by the balance sheet submitted to you for your approval to-day. Interesting as it is, however, to look back over the successes and disappointments of past years, I am not going to weary you with a further retrospect, but will now proceed to briefly review the principal figures of the balance sheet and profit and loss account for the twelve months ended the 30th of June, 1914.

Points in the Balance Sheet.

The issued capital of your company, £3,950,000, is unchanged.

The reserve fund, £250,000, remains at the same figure as at the 30th of June, 1913.

Sundry creditors, £474,636. This account reflects a decrease of £243,000 which is accounted for by the reduction of deposits with, and the ordinary current liabilities of, the company. These amounts are naturally constantly fluctuating.

Contingent liabilities, £44,307. A decrease is here shown of £12,627, representing the payment of certain obligations undertaken.

Turning to the assets side of the balance sheet:

Investments in stocks and shares, £3,221,784. This account shows a decrease of £214,681 as compared with the figures of the previous year. It was, of course, inevitable with the disturbed condition of the money market just prior to the declaration of war that we should have to face a very heavy depreciation on the book value of our shareholding, but I think we may congratulate ourselves on being able to write this depreciation off out of the profit earned during the year, without having to encroach on the reserve fund or disturb our dividend distribution. Your directors have followed their usual practice of writing down the "book value" of all shares to their "market value" at the 30th of June wherever the former reflected an excess over the latter. The "market values" at the 30th of June last were naturally low, but with the return of normal conditions it is only reasonable to anticipate that the greater portion of this depreciation will be recovered. The market value of your shareholdings over their book value at the 30th of June last, for which no credit has been taken in the accounts now submitted to you, exceeded one million pounds.

Mining properties and advances to mining companies, £63,424. A small decrease of £1,460 appears under this heading and represents the partial repayment to us of certain loans.

Real estate and buildings, £650,888. As compared with the figures at the 30th of June, 1913, this account shows a decrease of £11,000. The major portion of this is accounted for by the sum annually applied to the redemption of the ground rent capitalisation account, the balance represents the book value of the ground sold on your suburban estates during the year under review. The times have not been propitious for the sale of building sites and the development of our estates, but still I think, taking all the adverse circumstances into consideration, we have every reason to be satisfied with the progress made. I referred in my speech at our last annual meeting to the construction of golf links on the lower Houghton Estate; I am pleased to be able to state to-day that these links have now been completed and the Houghton Estate Golf Club duly formed. I gather that the members of the club are highly satisfied with the lay-out of the course, and I have no doubt it will greatly add to the popularity, and materially assist in the development of the neighbourhood. The Berea and Yeoville Estates maintain their reputation as leading residential suburbs, and during the past year many attractive residences have been erected thereon. We have been successful in disposing of a fair number of building sites on the Westdene Estate, and this property continues to make satisfactory progress. Your town properties have yielded a reasonable revenue during the period under review. I am pleased to state that the hope I expressed at our last meeting of a reduction in the amount of the assessment rate has since been realised, and I trust the new Council when elected will see its way to effect further economies in the administration of the town's affairs, and a consequent further reduction of taxation. The Carlton Hotel has prospered as well as could be expected under the conditions that have existed, but is naturally feeling the present general depression.

Lourenco Marques.

I regret that I am still unable to give you any satisfactory report as to the condition of affairs at Lourenco Marques.

Your house properties there are fairly well let, but the conditions that at present obtain are not such as to justify us in proceeding with further development.

Loans on mortgage and real estate, £168,594. This account reflects an increase of £64,520, representing new business of this class arranged in London. I am pleased to be able to inform you that your advances under mortgage bonds are all amply secured and in a highly satisfactory position.

Loans at short call on market securities, £590,750. A decrease of £120,613 is shown under this heading. This business is at present entirely conducted in London, and constantly receives the most careful consideration of your directors on that side.

Sundry debtors and dividend accrued, £285,545. The increase of £35,196 reflected in this account is chiefly represented by increased dividends earned, the balance being the ordinary current accounts of the company which naturally vary from time to time. The remaining items do not call for any explanation.

The total book value of your assets at 30th June, 1914, amounted to £5,042,661, a decrease of £241,101, as compared with 1913. From my earlier remarks you will have gathered that this decrease is principally due to the depreciation written off your shareholdings, and which we trust will be recovered. Your assets show a surplus over your liabilities, exclusive of the dividend of 5 per cent. declared on 20th June last, of £4,568,000, a slight increase over last year's figures. Gentlemen, I think these figures may be regarded as satisfactory evidence of the strong financial position of the company.

I now turn to the profit and loss account. You will note from the figures now before you that the profit for the financial year ended 30th June, 1914, amounted to £230,378, being £1,740 less than for the previous year. The working expenses amounted to £30,782, reflecting a small decrease of £172, as compared with the year ended 30th June, 1913, leaving a net profit of £199,596, a decrease of £1,568 on our last financial period. The amount carried forward is increased by approximately £2,000. This, gentlemen, finishes my review of the balance sheet, profit and loss account and the general financial position of our company, and I will now proceed to give you a few particulars of the mining companies in which we are more particularly interested

Mining Companies.

The gold mining companies which are associated with this Company have been most successful in their operations during the period under review. At the last annual meeting I had pleasure in calling attention to the reduction in working costs which had been achieved, and to the hopes which were entertained of still further improvement. It is most gratifying to record that these hopes have been more than realised, as the following comparative figures will show:

Average group cost for 1912, 16s. 1d. per ton crushed .

Average group cost for 1913, 16s. 6d. per ton crushed.

Average group cost for 1914 (January to September) 14s. 8d. per ton crushed.

Though advantage has been taken in the case of some mines to work reef of lower grade as costs have come down, the profits realised have also benefited by the reduction. For the month of September, 1913, when the average working costs were 16s. 4d. per ton, the gross profits of the mines of the group amounted to £99,115, whereas for September, 1914, working costs averaged 14s. 2d. per ton, and the gross profits totalled £114,996. These results have been achieved in spite of many adverse factors. The general strike which occurred in January caused a certain amount of dislocation, though fortunately in consequence of the strong and energetic action of the Government it was too short-lived to have much effect on the native labour supply.

Business as Usual.

More recently, we have had to face the serious state of affairs brought about owing to the general conflagration which has occurred in Europe. As you are no doubt aware, the gold mines are dependent on Oversea sources for the bulk of their supplies. Such materials as cyanide, zinc, mercury, lead acetate, permanganate of potash, detonators, oils, etc., are not produced in South Africa, and in some cases Germany was the principal source of supply. When the war broke out, therefore, prompt steps had to be taken to secure the continuance of regular shipments of such stores as were essential to the carrying on of our mines. Fortunately for this group, our cyanide contract was in the hands of a purely English firm—the London Gas Light and Coke Company—and we have no fear but that this firm will keep us supplied with what is one of the main essentials to the recovery of the gold. With regard to zinc—which fulfils a most important function in the cyanide process—the export of this metal from the United Kingdom has been prohibited during the existence of the war, and as a large percentage of the world's zinc smelting was carried out in Germany and Belgium, the only market we could turn to was America. Here we were fortunate in placing an order for a considerable quantity of zinc early in August, and we have also made arrangements for a regular supply from this source. It is not anticipated that the supply of mercury will be interfered with. A small quantity was produced in Austria, but Spain and Italy are the main sources of supply, and there is every reason to hope shipments will come forward regularly. Explosives are also of the greatest importance to the continuance of mining operations, but, as the three explosive factories in South Africa carried large stocks of raw materials, it is hoped that there will not be any interruption of operations from that quarter. Our detonator contract is in the hands of a Glasgow firm, and there has been no suggestion of a shortage. The position with regard to one or two of the less imprtant lines is more obscure, but steady progress is being made towards the resumption of normal conditions in the supply of mine stores.

Consolidated Langlaagte.

There has been a marked improvement in the profits realised by this company since the beginning of the year. For the nine months ended September, the total profits amount to £225,942, which is only some £26,000 short of the total profits for the whole of 1913. This increase has been largely due to the reduction in working costs, which averaged 17s. 7d. for 1913, whereas for the nine months of this year the average has been under 15s. per ton milled. Development operations have proved that the reefs maintain their value further to the south, and the ore reserves are being kept at well over two million tons. An initial dividend of 10 per cent. was declared at the end of 1913, and a further distribution of 10 per cent. was made to shareholders registered at the 30th June, 1914. The outlook is particularly promising, and the balance of the higher profits which are being made will be available either to redeem the outstanding debentures at a more rapid rate than was provided for when they were issued, or to pay increased dividends.

Ginsberg.

Fluctuations in grade which have been experienced at this mine for some months past have had a disturbing effect on the profits, which have not been so high as those of 1913. With the steady exhaustion of the wide payable reefs in the South (Ginsberg) Section, we have had to depend more and more on the North (Balmoral) Section, and it is known that the values here are not so regular as they have proved to be in the South Section. At the present time about two-thirds of the ore mined is drawn from the Balmoral shafts. For the first nine months of this year the gross profits amounted to £34,936. Working costs were reduced by 1s. 5d. per ton as compared with 1913. The development remaining to be done is practically confined to the south-east corner of the North Section, and here promising values are being exposed. Quite a lot of ore is being obtained from reclamation, and the declared ore reserves are only being depleted very gradually.

Glencairn.

The profits realised at the Glencairn mine have been remarkably steady since the beginning of the year. On the average they show a small improvement over those for 1913. The development of the mine is now complete, but considerable quantities of ore are being obtained from reclamation.

Government Areas.

It gives me great pleasure to inform you that the Government Gold Mining Areas has now entered the producing stage. Trial crushings were made towards the end of October, and the mill is now running steadily. A brief glance at the history of the company will show that we have every right to regard the position as it is to-day with pride and satisfaction. The lease with the Government was signed on the 27th January, 1910, and it was some months after that date before actual operations on the property were commenced. It will be seen, therefore, that the mine has been brought to the producing stage in about four and a half years from the flotation of the company. This is undoubtedly a record for deep level mining on the Rand, and when the magnitude of the property is considered, together with the great depth at which the reef is situated, it is a record which will stand comparison with mining enterprise in any part of the world. The reef on the property has been intersected by four seven-compartment vertical shafts, the total footage sunk amounting to 12,349 feet, which is equal to two and one-third miles. The lineal development which has been carried out since the shafts intersected the reef totals 60,000 feet, or approximately eleven and one-third miles. When I addressed you a year ago I had to point out that development results up to that date were not quite all that we could have hoped for. A remarkable change has taken place in the prospects of the company since that time. In almost every direction in which development has been carried on we have encountered payable, and in many cases highly payable, values. This experience has not been confined to any particular shaft, but is general at all four shafts. As indicated by the figures given above, excellent progress has been made with the development of the mine, and since the beginning of the year the ore reserves have been increased by 1,600,000 tons. At the end of September they stood at 2,159,636 milling tons of an average assay value of 6.51 dwts. When the board of the Government Gold Mining Areas decided eighteen months ago to go ahead with the erection of a reduction plant, it was felt at the time that there was an element of risk attached to such a policy, but the excellent progress made with the development, combined with the highly satisfactory values exposed has justified the step which was taken. The main object which actuated the directors at that time was to bring the mine to a revenue-producing stage at the earliest possible moment, in view of the heavy outlay of capital which was being incurred. It was recognised then, as it must be now, that the profits which will be derived from a crushing of 50,000 tons per month will not be commensurate with the magnitude of the property, and it is, therefore, our intention at the earliest possible moment to increase the crushing capacity to probably double that of the present plant. However, the war which is raging between the great Powers of Europe has had such a serious effect on the world's finance that it is difficult to make any statement in the meantime with regard to future expansion, but you can rest assured that immediately the opportunity offers itself arrangements will be made to put the company's finances in such a position as will permit of the additional plant being erected.

New Primrose.

It has not been found possible to maintain the monthly profits of the New Primrose Company at the high level of previous years. The mine has had a remarkably prosperous career, but it was clearly indicated a year or so ago that it would not be wise to expect a continuance of big profits for an indefinite period. As compared with 1913, working costs have been reduced by about a shilling per ton, and for the first nine months of this year the profits realised have been at the rate of £12,155 per month. These profits have been obtained from the treatment of ore of comparatively low grade, of which considerable quantities still remain in the mine. About 50 per cent. of the ore milled is being obtained from reclamation, and the Southern Series is also contributing a small percentage. A certain amount of development is being carried on, and the ascertained ore reserves are being fairly well maintained.

New Rietfontein.

The position at the New Rietfontein is somewhat precarious. We have succeeded in making a small profit during the year, but there has been considerable difficulty in keeping the mill supplied with ore of sufficient value to keep the balance on the right side.

New Unified.

The high degree of efficiency which has been achieved at the New Unified mine is shown by the following figures:

Working costs for 1912, 21.269 shillings per ton. Working costs for 1913, 17.622 shillings per ton. Working costs for 1914 (January to September), 14.320 shilling per ton.

This reduction in working costs will have a most important effect in extending the life of the mine. Some years ago it was generally assumed that the South Reef was of too low grade to repay the cost of mining, and the life of the mine was calculated entirely on its Main Reef Leader contents. To-day the South Reef is being developed and stoped over considerable areas of the mine. In addition to this a large percentage of ore is being obtained from the Main Reef. This reef, which as a general rule was left standing when the Main Reef Leader was stoped, can be very cheaply mined, and although the grade is low there is a fair margin of profit in working it. As a result, the Main Reef Leader ore reserves are being conserved to a large extent, and there is every reason to believe that the mine will continue to maintain its present rate of profits for a considerable time.

Quest.

A small profit continues to be made at the Quest. Recently it was decided to make an experiment in the use of small stoping drills. These have just been started, but it is too early yet to say whether their adoption will lead to any improvement in the results.

Van Ryn Deep.

At our last annual meeting I referred to the future of the Van Ryn Deep in an optimistic vein, and the remarks in which I indulged on that occasion have been more than justified by the results which have been obtained. The mine has continued to open up in a very gratifying manner, and the position underground to-day is more promising than ever it was. The profits realised since the beginning of the year have shown an increase month by month, and have risen from £20,152 in January to £38,334 in September. During the same period costs have been reduced from 20.262 shillings per ton to 15.242 shillings per ton. These figures speak for themselves, and in addition to this it should be noted that the October profit has just been declared at £40,170. Steady progress is being made with the sinking of both the east and west incline shafts, and the driving of the seventh level at both shafts has been commenced. All the indications point to excellent values being encountered at this level of the mine, and these indications, taken in conjunction with the high grade ore being developed by our neighbour on the south east boundary—the Modder Deep Levels—confirm the opinion that in the Van Ryn Deep we have a most valuable holding which will amply repay the large amount of capital which this company has invested in it. An initial dividend of 7½ per cent. was paid for the period ended December last, and a further distribution of 12½ per cent. was made for the first six months of this year.

Witwatersrand.

The Witwatersrand Company has had a most prosperous year to date. For the first nine months of 1914 the gross profits averaged £24,440 per month, as compared with an average for 1913 of £22,426. There has been a considerable increase in the tonnage milled, and costs have been reduced by 1s. 6d. per ton. The development of the outcrop mine is practically complete, and attention has been directed almost entirely to the opening up of the southern section. At the vertical shaft connection has been established with the northern incline, and the southern incline has been sunk 661 feet. The most of the development so far has been carried out from the northern incline, and has exposed large blocks of reef of good width and value. The additions to the reduction plant have given every satisfaction, and have increased the milling capacity of the plant to some 50,000 tons per month. We had every hope of working up to this tonnage, but unfortunately the native labour strength was considerably reduced in August, owing to some large gangs of boys taking their departure immediately their contract periods had expired. Since then this wastage has been largely made up, but unfortunately the exodus caused a certain amount of disorganisation underground, and it will probably take some time to work up to our full capacity. Two dividends—each of 25 per cent.—have been paid to shareholders this year.

Outside Mines.

I shall now refer briefly to mines in which we are interested, but which are outside our control.

Ferreira Deep.—This company made a greater profit for the year 1913 than it had previously made in its history, and the profits so far declared for this year have been highly satisfactory. Two dividends of 25 per cent. each have been declared this year, and the company has still considerable cash resources in hand. The position of the company is all that could be hoped.

Main Reef West.—The profits made by this company show a decrease as compared with the previous year, and the development has yielded results which are not too satisfactory. The mine has been handicapped by a shortage of native labour; but development is being pushed ahead, and it is hoped that better times are in store for this proposition.

Cinderella Consolidated Gold Mines.—Owing to the financial position, it was found impossible to raise further funds for the opening up of this large property, and consequently it was closed down last November. It is hoped that when times are more propitious it will be possible to devise some method of dealing with the finances of the company.

Diamond Shares.

Owing to the unsatisfactory position of the diamond market a conference of producers was held in London during July of this year. An agreement was come to which would undoubtedly have had a very beneficial effect on the profits of diamond mining companies. Unfortunately the war has supervened and diamond mining has ceased. However, although under a cloud for the present, the diamond mining industry is likely to be re-established on a firmer basis than that on which it has hitherto rested, and we are satisfied that your interest in diamond mining companies will prove a profitable investment in the years to come.

The War and the Mines.

Gentlemen, before I sit down there is still one more subject to which I must refer. To-day Europe is devastated by a terrible war. It has already entailed heavy sacrifices on all concerned, and heavier sacrifices will yet have to be faced. How long hostilities will last, or what the after effects of this stupendous struggle will be it is impossible to forecast, but its immediate effect has been the practical suspension of all financial business. At the outbreak of war in August last the importance of continuing the gold mining industry, and of doing our utmost to maintain the output was most strongly impressed upon us by both the Home and Union Governments. This duty in spite of all difficulties we have done our utmost to discharge, and I think both those responsible for carrying on the industry and the employes who have so loyally supported them have every reason to be proud of the success which has been attained. In this connection we have to express our thanks to the Union Government for making such financial arrangements with the Bank of England and the South African banks as enabled us to carry on the industry irrespective of the shipment of the gold produced.

Some apprehension was felt at the outbreak of the European war as to the native labour supply. There is no doubt that more natives than usual returned to their homes during August, and one of our mines—the Knights—suffered severely on this account. Fortunately the exodus did not continue, and for the months of September and October there was a slight improvement in the native labour position. More recently the rebellion in South Africa has led to the natives leaving somewhat freely, but so far the working of the mines has not been seriously interfered with. Owing to the vigorous action of General Botha and his Government we look forward with confidence to the early restoration of order in the Union. Gentlemen, I now beg to move that the report, exclusive of the addendum, and accounts as submitted, be adopted.

Mr. Imroth said he had much pleasure in seconding the motion.

The retiring directors, Sir Robert P. Llewelyn, Messrs. C. Marx, J. Munro, and H. A. Rogers, were re-elected on the motion of Mr. Pemberton, seconded by Mr. Aburrow.

The auditors, Messrs. J. P. O'Reilly and H. Hains, Johannesburg, and Messrs. Chatteris, Nichols and Co., London, were reappointed to office.

A vote of thanks to the chairman, moved by Senator Marks, concluded the business of the meeting.

THE SOUTH AFRICAN

Mining Journal,

WITH WHICH IS INCORPORATED

South African Mines, Commerce and Industries.

ESTABLISHED 1891.

VOL. XXIV., PART I.] NOVEMBER 21, 1914. [No. 1208.

HEAD OFFICE: 176-180, Stock Exchange Buildings, Fox Street (2nd Floor), Johannesburg, Union of South Africa.

Telephone **913.** P.O. Boxes **963** and **418.**

Cable and Telegraphic Address: **"MINING JOURNAL."**

AGENTS FOR GREAT BRITAIN: Argus Printing and Publishing Co., Ltd., Byron House, 82-85, Fleet Street, London, E.C.

AMERICA: Advertisements accepted from any recognised Advertisement Agency.

ANNUAL SUBSCRIPTION RATES: Oversea, £2; South Africa (by post), £1 10s.; Local Delivery (Town only), £1 6s.

Copies of this journal are obtainable at all Branches and Agencies of the Central News Agency, Ltd., at all News Agents and Railway Bookstalls throughout South Africa, and at the London Agency as above.

NOTICE.—The postage of this issue of the *S.A. Mining Journal* is: South Africa, 1d. All other parts, 1½d.

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Notes and News.

Driefontein Winding Accident.

The enquiry into the fatal winding accident at the Driefontein shaft of the E.R.P.M. has, we understand, been completed, and it is expected that it will find the driver guilty of negligence. His certificate will doubtless be cancelled, and an object-lesson and a warning thereby issued to all holders of such responsible positions. The human factor has, of course, always to be reckoned with in dealing with winding engines; and when we look back over the history of the Rand the wonder is not that that factor has often failed but that it has failed so seldom to meet the undoubtedly severe strain that must necessarily be imposed upon it.

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S.A. Institute of Engineers.

The meeting of the S.A. Institute of Engineers last Saturday night, under the Presidency of Mr. E. J. Way, was marked by the presentation of several contributions of more than ordinary importance. Elsewhere we print a report of the reply made by Messrs. Izod and Laschinger to the discussion on their paper on rock drills read a year ago before the Institute. The globular savings which the Corner House engineers have been able to effect have caused something of a sensation in mining circles, and we believe a good deal of the increased attention that has lately been shown to rock drill economics is due to the fillip given by the publication of the results of their efforts. The authors' success has encouraged them to make fresh efforts in the same direction, and in no department of Rand mining, we believe, could those efforts be better applied. Several interesting contributions were made to the discussion on Mr. Clark's paper on " The Test of the Largest Air Compressor," and some of the opinions expressed were, to say the least, forcible. Of the other contributions read, we hope to print a summarized report in our next issue. Unfortunately time did not permit of the impromptu discussion of a mining subject which was to have been introduced by Mr. R. C. Warriner. We quite agree with Mr. Laschinger that had Mr. Warriner's intention been known a much bigger audience would have attended.

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The History of Rand Sandfilling.

In giving credit, as we rightly did, last week to the Village Main Reef for being the pioneer of sandfilling on the Rand, it should have been added that the Wemmer section of that property was really the first to adopt the system. It is amusing to note that Mr. Gullachsen fathers the idea of sandfilling on President Kruger, of whom is recorded the half-jocular threat to make the mines replace the unsightly dumps of the Rand back in the mines. Apparently having no use for some 7 dwt. " stuff " in the early days when outcrop values were reckoned in ounces, the Wemmer people refilled a portion of their old stopes therewith. In later and less opulent times, however, they were glad to take it out and retreat it. In our next issue we hope to give a detailed account of the subsidence at the Village Main, showing how sandfilling saved the situation.

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The Swaziland Coalfields.

In another part of this issue we print the opening portion of a paper read last week by Mr. Jervis Garrard before the Geological Society on the coalfields of Swaziland. Mr. Garrard is, of course, well known as the consulting engineer of the " T.C.L.," which has big interests in the area treated. It is not too much to say that no other mining man on the Rand has so wide and intimate a knowledge of the " outside " districts of this Province and Swaziland as Mr. Garrard, and his reports on Zululand and Natal mining, made before the war when he was Mining Commissioner of the former still stand as the most authoritative of their kind. Mr. Garrard's paper will be found of great scientific and economic interest; and is likely to evoke an interesting discussion.

A Timely Appointment.

The appointment of Mr. F. C. G. Roberts, lately manager of the Knights Central, as Technical Adviser of the Chamber of Mines has met with a general welcome throughout the industry. Mr. Roberts has a reputation second to none as a highly-qualified mining engineer who has won his spurs and much experience on the Rand. His good work at the Knights created something of a mild sensation some years ago; and since then he has never looked back. The problems before the Chamber of Mines, like those before the Rand generally, do not tend to become less numerous or difficult as the years go by, and the Chamber will, doubtless, find the ready counsel of their new technical adviser always helpful and often invaluable.

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Zaaiplaats.

The full report of the Zaaiplaats meeting which we print in this issue, besides having a special interest for shareholders at this juncture, will be found of general interest to all interested in Transvaal tin mining. The account of the metal market and of the arrangement with the staff at the mine is not new, but the Chairman's explanations includes details that have not before been published. The cash position is satisfactory, and given a better metal market the company would doubtless soon regain its old prosperity.

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E.R.P.M. Development.

Development at the E.R.P.M. continues to result satisfactorily. In the three months ended September 30 last 14,163 feet were driven, risen and sunk. Of this 10,263 feet were sampled, the average reef channel width being 28 inches, the average assay value over that width being 9·5 dwts.

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E.R.P.M. Debentures.

The E.R.P.M. announce that since in terms of the debenture trust deed the company has annually to pay off one-fifteenth of the outstanding debentures at 1st March, 1914, and whereas at that date £1,350,000 of debentures were outstanding and whereas the company has purchased since the 1st March, 1914, £90,000 (*i.e.*, one-fifteenth of £1,350,000) of debentures of the above issue, notice is hereby given that the said £90,000 of debentures will, pursuant to the conditions endorsed upon the said debentures and the provisions of the above mentioned trust deed, be treated as a satisfaction of the obligation of the company to make a drawing of debentures for payment on the 1st day of March, 1915, and no such drawing will therefore be made.

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Ore Reserves of Neumann Mines.

Development on Neumann mines in the quarter ended September 30 last yielded unequal results. At the Main Reef West the ore reserves at 30th June, 1914, were 526,440 tons; the ore developed for quarter was 17,040 tons; the ore mined for quarter was 71,907 tons, less reclamation, etc., 7,527 tons, or 64,380 tons net; leaving ore reserves at 30th September, 1914, 479,100 tons. At the Knight Central the ore reserve position is as follows:—North of dyke: Payable ore exposed as at June, 30th, 1914, 506,400 tons at 6 dwts. over 60 inches; payable ore exposed or developed during quarter ended September 30th, 1914, 30,600 tons at 4·4 dwts. over 62 inches; total, 537,000 tons at 5·9 dwts. over 60 inches; less ore mined from payable blocks during quarter ended September 30th, 1914, 73,100 tons at 5·7 dwts. over 62 inches; total ore reserves as at September 30th, 1914, 463,900 tons at 5·95 dwts. over 60 inches. No ore south of the Simmer dyke has yet been included in the ore reserve estimates. At the Consolidated Main Reef the ore reserves at 30th June, 1914, were 693,460 tons; ore developed for quarter was 60,180 tons; less ore mined for quarter, 87,941 tons, less reclamation, etc., 24,521 tons, or 63,120 tons net; leaving ore reserves at 30th September, 1914, 690,220 ton. At the Wit. Deep the payable ore exposed at 30th June, 1914, was 1,704,997 tons at 6·79 dwts. over 53·54 inches; payable ore developed during quarter ending 30th September, 1914, 108,849 tons at 6·50 dwts. over 60·25 inches; total, 1,813,846 tons; less ore mined from payable blocks during quarter ending 30th September, 1914, 90,912 tons; payable ore reserves, 30th September, 1914, 1,722,934 tons at 6·77 dwts. over 53·90 inches.

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The Disappointing Position of the Bantjes.

The report of the directors of the Bantjes for the quarter ending 30th September, 1914, states, *inter alia*, that the number of feet driven, sunk and risen, exclusive of stopes was 4,787 feet. The reef disclosures were as follows:—Main Reef Leader: Distance exposed, 850 feet; width, 13 inches; assay value, 47s. 11d. South Reef: Distance exposed, 1,835 feet; width, 12 inches; assay value, 50s. 10d. Development operations continue to disclose reef of poor value, although improvement is shown in places, but taken as a whole values are disappointing. Serious reduction in the ore reserves, both as regards tonnage and values, when they come to be re-calculated at the end of the year, must be anticipated as the result of this prolonged continuance of low values. The sinking of the main incline shaft has been resumed and 79 feet of advance was made, ordinary development also showing a further increase of 118 feet for the quarter.

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The City Deep's Improving Position.

The report of the directors of the City Deep for the quarter ending 30th September, 1914, shows, *inter alia*:—Number of feet driven, sunk and risen, exclusive of stopes, was 5,425 feet. Main Reef: Distance exposed, 1,440 feet; width, 45 inches; assay value, 13s. 10d. Main Reef Leader: Distance exposed, 2,480 feet; width, 23 inches; assay value, 73s. 11d. South Reef: Distance exposed, 30 feet; width, 49 inches; assay value, 76s. 10d. A large amount of stripping and straightening of drives was done during the quarter, which was responsible for a decrease in development footage. No. 1 main vertical shaft was sunk 190 feet, and is now 45 feet below the 14th level station. There still remains 98 feet of sinking to be done. The circular ventilation shaft was sunk a further 398 feet, and the total depth is 1,781 feet. The sinking of No. 2 incline shaft has been stopped pending the arrival of the permanent winding engine, delivery of which has been delayed by the war. The capital expenditure for the quarter amounted to £16,651. The balance to be spent on authorised work is £43,875.

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New Hoists for Durban Roodepoort Deep.

Estimates and drawings are now in hand for two hoists which will be required for the subsidiary underground inclines at the Durban Roodepoort Deep. A start will have to be made with their erection during the coming financial year, which begins on January 1st, 1915. Little capital expenditure has lately been indulged in at this mine.

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Springs Makes Connection.

At the Springs Mines connection was made this week between the North and South shafts, and all concerned are to be congratulated on the excellent work done. It may be remembered that the north shaft was started in August, 1909, with windlasses, and on 26th October with hoisting engines. The south shaft was started in August, 1909, with windlasses and on 30th November, 1909, with hoisting engines. The north shaft depth to reef was 3,433 ft. and 3,545 ft. was the total depth. The reef in the south shaft was struck at 3,692 ft., and 3,826 ft. was the total depth. The reef was struck at north shaft on March 16th, 1913, and in the south shaft on August 13, 1913. The north shaft incline, on which connection has just been made, was commenced in May, 1913, and stopped on 11th August, 1914, having attained 2,156 feet horizontal distance. From the south shaft the connection was started in October, 1913, and on 14th November, 1914, at 2,344 feet connection was effected, the total distance being 4,500 feet. The differences in co-ordinates were N.-S. 0·28 feet, E.-W. 1·35 feet. There was a difference of 1 minute 5 seconds on bearing, and a difference in elevation of 0·39 feet—a result upon which all are to be congratulated.

"The New Rand" Redivivus.

Though Borehole No. 20, sunk to a depth of 2,261 feet, on the New Rand Property has proved no more successful than its predecessors, Mr. A. R. Sawyer, nothing daunted, is raising further funds to start borehole No. 21 at a point 1,500 feet from No. 20. Mr. Sawyer anticipates that the site of No. 21 borehole will prove well beyond the diabase intrusions "which have so interfered with our object in these last boreholes." Mr. Sawyer's pertinacity, at any rate, deserves success, if it does not command it.

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The "Goldfields" Report.

It is not surprising to find that the annual report of the Consolidated Gold Fields of South Africa, Ltd., contains an announcement of no further dividend for last year. The report shows a realised profit of £388,067, from which preference and interim dividends, etc., have been paid, leaving a balance of £131,091. To this amount £62,516, brought forward, has been added, making the total £193,607. This amount, together with £150,000 from the reserve fund, goes to meet a depreciation of £259,136, leaving a balance of £84,471 carried forward. The report adds that the directors propose to utilise a further £850,000 from the reserve fund to write down certain assets. This action is solely due to the war. The directors regret that, owing to the gravely altered position, they are unable to declare a dividend, which otherwise would be done. The report says that, despite difficulties concerning labour, etc., working costs are still considerably lower than the average on the Witwatersrand. The report emphasises that the Rand has made every effort to overcome difficulties arising from the war, that there is every reason to believe that there will be no break in the continuity of supplies, and that a sufficiency of labour will be forthcoming to ensure the carrying on of operations and normal mining conditions.

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African and European.

The African and European Investment Company, Ltd., has suffered severely from the adverse market conditions which have affected for so long most South African finance enterprises. For the year ended June 30 last the directors have to report a net loss of £2,410 against a profit of £5,268 for 1912-13. The credit balance at profit and loss account is accordingly reduced to £2,858. The chief adverse item for the past financial year is £10,000 on account of "losses on realisation of shares, bad debts and amounts written off." Rentals and farm revenue were well maintained, but receipts from interest, dividends and sundry profits showed a sharp falling-off. The financing of several of the company's subsidiary operations will naturally have to await better times. Meanwhile the Vereeniging Estates, which, next to the land, forms its most important investment, continues to make satisfactory progress, the coal output during the past year showing a steady monthly increase. A new colliery is also being developed and equipped by the company to enable it to extend its trade. The African and European is directly or indirectly largely interested in two leading Rhodesian mines—the Lonely Reef and the Cam and Motor. The former paid 30 per cent. in dividends in the year under review, while the latter is expected to reach the dividend-earning stage shortly. A half interest has been purchased in certain mining properties in Rhodesia known as the Jessie, West Nicholson, Valley, Geelong and Eagle Vulture mines, representing a total area of 254 claims, together with all the machinery and plant on the properties. Steps are being taken to lease the smaller mines on tribute with a view to rendering the whole group of properties self-supporting until such time as capital is available for the further development and additional equipment of the larger mines of the group. A one-third interest has also been acquired in 1,050 claims in the Barberton district. Prospecting operations were started on this property in April last, but in consequence of the outbreak of war the directors considered it prudent to stop further expenditure in this direction for the time being.

TOPICS OF THE WEEK.

A WONDERFUL RAND MINE.

Had not public attention been engrossed on the more exciting business of war, it is safe to say that the statement laid before the New Modderfontein shareholders at the annual meeting this week would have created something of a sensation in mining and financial circles. It is dangerous to generalize in regard to gold mines, but we can recall no instance of a gold mining company presenting a finer all-round showing to its proprietors. By a unique combination of good mining, good fortune, and good management, the property has been raised to such a position of eminence that to-day it stands a monument to the skill and foresight of its financial and technical directors, as well as to the great natural richness of the Rand at its best. The New Modder, of course, has always been recognised as a great mine, and on the bourses of Europe in those seemingly far-off days before July 30, the shares were always regarded as the Consols of the Rand. That high esteem has been amply justified by the position of the property to-day and by the promise it holds out for the future. In one respect shareholders may feel disappointment. In view of the war and until the outlook has cleared the directors have decided to delay the erection of the additional reduction plant, and in the circumstances it is impossible to question the wisdom of a precautionary measure which, after all, merely represents on a larger scale what all prudent people are doing to-day in private life.

Mr. Schumacher's speech at the annual meeting on Monday was a model of what such a statement should be. It was packed with all the facts that every shareholder ought to know, but which are seldom vouchsafed by mining companies conducted on the bad, old slap-dash methods—fortunately now no longer fashionable on the Rand. With justifiable pride he pointed to the magnificent total and value of the tonnage developed in the year—no less than 1,990,400 tons going 9·5 dwts. per ton. This he modestly described as a "fine record," and we certainly can find no trace of its having ever been beaten. It is difficult, likewise, to find adjectives worthy of the globular total of ore reserves at June 30, viz., 6,334,500 tons of an average value of 8·4 dwts. Read in the light of the reduction of working costs to 14s. 11d., these figures spell certain obvious profits and make the immediate future of the mine roseate indeed. On the larger and more vital question of the life of the mine Mr. Schumacher said everything short of committing himself to any hard and fast figure. But he gave all the factors, indicating where necessary their variability, in such detail that the veriest novice can make his own approximation. Whatever the future may have in store for the Rand, the outlook for the New Modder is certainly of the best. "The mine," said Mr. Schumacher, "is working at ease under favourable conditions, and is in a position to produce a much larger quantity of ore than can be treated by the existing reduction plant. The general tendency is for working costs to show a further gradual decrease." Perhaps only a harassed Rand mine manager can fully appreciate all that the foregoing connotes, but anyone can understand that it means a great deal. How much can perhaps be guessed from the following opinion of an ultra-cautious Chairman, who certainly has nothing to gain by committing himself to the painting of rosy futures. "Probably," said Mr. Schumacher, "never in the history of gold mining has any large property had so solid a basis for high expectations as the New Modder mine has to-day."

Clear and convincing reasons for his faith in the property are contained in Mr. Schumacher's speech, and a careful study of it will well repay shareholders. He boldly forecasts the dividend declaration to be made next month; and the fact is eloquent of the confidence with which our mining leaders regard the issue of present events. That aspect of

Mr. Schumacher's statement seems particularly to have impressed Mr. Andrew Cohen and Mr. S. C. Black, who spoke at the meeting, and drew certain well-founded conclusions from the success of the mine. Plainly the promise and achievement of the New Modder constitute the finest advertisement that the Far East Rand in particular and the Rand in general can have to-day. "Dividends as usual" means industry as usual, and something more. It means that at a time when other fields of industry are silent altogether, or, at best, content to be mere providers of employment, the Rand is in a position to make its usual return on the savings that are represented by the capital invested in it. In the strenuous days to come, when the integration of industries that must follow the war is bound to cause a fierce competition for capital, may the fact be remembered in our favour. The New Modderfontein will then deserve well of the mining industry and of South Africa.

THE PROMISE OF THE FAR EAST RAND

The splendid note of confidence sounded at the New Modderfontein meeting came at an opportune moment. The mercurial Rand, which only a week ago was smiling at the tales of London suffering from the blues and in the depths of depression, has allowed itself to lapse into an unwonted atmosphere of doubt and hesitation. It is only fair to add that no fear of the outcome of events is at the root of this depression. Rather is it the sorrowful realization by the "average business man" that all the excitements and alarums of these great days will have to be paid for in hard cash, and that it may not be possible to shift the burden on to the shoulders of those who have caused the trouble. To a great English captain of industry we owe the maxim, "In times of war, prepare for peace," which is a brutal way, perhaps, of stating that one cannot too soon begin to prepare for the big problems that must face a country when the fighting is done. Here in South Africa we may accept it as axiomatic that the first of our desiderata is the broadening of the basis of taxation. In his budget speeches before even the echo of war was heard in the land, General Smuts told us so. And now with the added expense of armaments, the shrinkage of many avenues of commerce, of the farming industry and of base metal and diamond mining, even the unthinking must see that the Government will soon be seeking fresh sources of revenue, since the present ones are sucked dry and economy—certainly on a scale adequate to meet the threatened deficit—has no friends. Here is where the New Modder showing helps us. As we have indicated elsewhere, it is a unique advertisement for the potentialities of the Far East Rand. In that area, we all know, the Government holds some 86,000 claims lying idle and unproductive. The results of the New Modder, of the Geduld, of Springs Mines, Brakpan, and Daggafontein leave no doubt about the possibilities of the great area held by the State. We hope those responsible will forgive us when we say that the question of rendering productive those areas has hitherto only been tinkered with. Areas have been offered to tender one after another, clothed with a multiplicity of conditions and strangled with an impossible profit sliding scale. No capitalist with any sense could be found to entertain a proposition involving the locking up of, say, a round million sterling in sinking two shafts and developing one of the proffered areas up to the point when he would be graciously allowed to share the profits with the State. And if no capitalist could be found to do this before the war, *a fortiori* will none be found to do it in those future days when capital will be more than ever at a premium, caused by war's destruction and the needs of a rehabilitated Europe. The obvious solution is for the Government to call for unconditional tenders for the working of the areas, enough of which are already demarcated to allow of a beginning being made. It is too much, doubtless, to expect that any offers would be forthcoming in the present state of affairs, but things might be got in train for a start. A considerable period must elapse, of course, before work on any of those properties can, in the ordinary course of mining, become productive, and, therefore, no more time should be lost than is absolutely necessary. Sooner or later the war will be over, and peace will bring in its train a demand for a widened sphere of employment as well as a broadened basis of taxation. In the great Far East Rand areas we see the one obvious solution of the difficulty close at hand. The Minister of Mines and his advisers have here a great opportunity to relieve the future perplexities of his colleagues when the great question of footing the bill for the fighting inevitably comes up for consideration.

THE GOLD MINING INDUSTRY AND THE BRITISH MANUFACTURER.

"The fault will not be with us if British manufacturers do not continue to furnish our requirements of cyanide and as many other stores as possible for a long period of years."—Mr. R. W. Schumacher, Chairman of Rand Mines, Ltd., at the New Modder meeting.

Credit is due to Mr. Schumacher for thus courageously putting on record the attitude of his group towards what is, admittedly, a more difficult question than it seems. We are so thoroughly tired of hearing the shortcomings of the British manufacturer recited and his inability emphasised to cope with the State-supported and bank-aided enterprise of his German competitor in South African markets, that we are delighted to learn, authoritatively, that the outlook is now most satisfactory. Not only is the future brightening for British trade in South Africa, but the capture of a considerable share of that formerly going to Germany has, as a fact, already begun. But for the behaviour of the rebels in this country, the business world would certainly by now be feeling benefit from the beginning of change; and the improvement is, of course, merely delayed. To us the great and reassuring fact of the moment is that British manufacturers are showing such a splendid spirit in rising to the occasion. According to our trade informants Home manufacturers have shed most of the long list of failings to which successive expert trade investigators have in the past attributed the success of their competitors. The fact is that with German State subsidies removed and German bank financing inoperative, the British manufacturer can always hold his ground. The other factors of cheap German labour and "scientific" German business methods are apparently more than offset by, respectively, the superiority of British workmanship and the honest appeal of the British "fair deal." Gone, moreover, are the pride and procrastination of British exporters upon which every junior official of the Commercial Intelligence Department of the Board of Trade used to delight to write essays full of wise saws and modern instances. Gone, too, is the lackadaisical ineptitude which evoked from our present King, His Majesty King George V., when Prince of Wales, the famous exhortation to "Wake up, England!" Indeed, from all we can gather locally the British manufacturer was never more wideawake than to-day. German competition is, of course, out of the local market, and except for about a dozen special "lines" American competition was never in it. It would appear that in all except the aforesaid dozen special "lines"—in which the U.S.A. has put itself a long way ahead—the United States are too busy with home and South American markets to worry much about us. Therefore the British manufacturer has the field to himself in South Africa, since he alone now possesses the organization and the connection to do the business. And in the words of one of the leaders of the mining industry to us this week, we, too, "hope he will get and keep it all."

POLICY OF THE PREMIER DIAMOND MINING CO., LTD.

How Diamond Prices Are to be Maintained in the General Interest.

MEMBERS of the trade (remarks the *Jewellers' Circular*) will be interested in a letter recently sent by the London representative of the Premier Diamond Mining Company to a New York and Antwerp diamond house, outlining the policy of the company in regard to future prices of diamonds. While the trade generally has understood that the stocks of rough diamonds were solidly held, and there was little chance of the war having any effect upon diamond prices, even when rough is again put on the market, nevertheless final assurance by this large company to the effect that no diamonds at cheaper prices will go into the market, as far as this company is concerned, and that the London Diamond Syndicate has adopted the same policy, will be received with pleasure. The assurance came about in this way:—A member of the firm of Goldmuntz Bros., 87 Nassau Street, New York, while in London recently, called at the office of the Premier Company and asked for a statement from the company as to its policy in regard to the rough diamond markets when the war is over. In answer thereto the following letter was sent from the London office of the company, September 16:—

London, Sept. 16, 1914.

Messrs. Goldmuntz Freres, Antwerp.

Dear Sirs,—In reply to your inquiry, my company stopped mining operations at the beginning of August, and dismissed its labour forces, consisting of 850 white men and 14,000 natives. I understand that it is not the intention of my Board of directors to re-open the mine before the war is over or before the general business conditions warrant such a step. In the meantime my company has resolved to uphold prices of diamonds by only satisfying genuine demands at prices and assortments ruling before the outbreak of hostilities. You may therefore rest assured that no diamonds at cheaper prices will come into the market as far as my company is concerned, and I understand the London Diamond Syndicate has adopted the same policy.—I remain, dear sirs, yours faithfully,

W. BUSCH,

Representative of the Premier (Transvaal) Diamond Mining Co., Ltd.

RECENT PROGRESS ON BARNATO MINES.

Review of Results from June to September—Position of the State Mines.

AT the annual meeting of the Johannesburg Consolidated Investment Company, Ltd., last week the Chairman, Mr. J. Munro, reviewed the position of the mines of the group to date. The quarterly reports of the companies of the group, issued this week throw further light on the position as at September 30 last. We make the following extracts:—At the Consolidated Langlaagte the returns for the quarter have been of a most gratifying nature. Working costs were reduced by a shilling per ton, and as the grade was maintained and the tonnage crushed was increased by 2,500 tons. the gross profit was higher than that for the previous quarter by £8,128. The east incline shaft was sunk 54 feet to a total depth of 3,133 feet, and the west incline shaft was sunk 43 feet to a total depth of 2,683 feet. The result of development operations was satisfactory, and the payable ore reserves have been augmented. At the Ginsberg the quantity of ore milled was increased by 754 tons as compared with the previous quarter. The grade of the ore sent to the mill was fully equal to that of the preceding three months, but, owing to the necessity to consreve the mine's stock of zinc, only a partial clean-up was made in the cyanide plant for the months of August and September. As a result there was a reduction in the recovery value of ·907 dwt. per ton. Working costs were reduced by sevenpence per ton, and the gross profit was only £547 less than that for the previous quarter. The extra gold left in the cyanide plant will be recovered in future months. Improved values have been met with in the development of the south-east corner of the north section, and it is hoped that a large tonnage of payable ore will be obtained from this section of the mine. At the Glencairn the quantity of ore milled was increased by 1,762 tons, and working costs were reduced by over fourpence per ton as compared with the previous quarter. The grade was slightly lower, and there was also a drop in the revenue from accumulated slime treatment. Notwithstanding this, the gross profit showed an increase of £368. No ore was developed, but of the quantity milled 39,283 tons were obtained from reclamation and other sources, and the ascertained ore reserves were depleted by 25,750 tons. At the New Primrose the tonnage crushed was practically the same at that for the previous quarter. The grade was slightly lower, but as working costs also showed a small reduction, the gross profit was only £65 less than that for the preceding three months. At the New Kleinfontein it was not found possible to maintain the grade at the level of the previous quarter. The recovery value showed a reduction of 3·729 shillings per ton, which, however, was partly due to less zinc than usual being cleaned up in the cyanide works. Fortunately, working costs were lower by two shillings per ton, so that the mine was able to make a small profit. Development and prospecting operations continue to disclose patches of payable reef, and of the ore milled 16,563 tons were obtained from reclamation. At the New Unified working costs were further reduced by nearly one shilling per ton, and there was an increase of 1,930 tons in the quantity of ore milled as compared with the previous quarter. This permitted of a greater quantity of low grade ore being mined without disturbing the usual scale of profits, the total gross profit for the period being slightly higher than that for the preceding three months. The development of the South Reef has exposed ore of somewhat erratic value, but, taken as a whole, the results are satisfactory. At the Van Ryn Deep the reduction plant was run at its full capacity during the period under review, with the result that an additional 4,200 tons were crushed as compared with the previous quarter. Working costs were further reduced by 1s. 7d. per ton, and there was an increase in the gross profit of £11,244. The east incline shaft was sunk 91 feet to a total distance of 2,885 feet. The seventh level station was cut, and a cross-cut to the reef was commenced and driven 145 feet. The west incline shaft was sunk 209 feet to a total distance of 3,431 feet. The development of the mine has exposed reef of satisfactory value, and the ore reserves were augmented during the quarter by 42,469 milling tons. At the Knights there was an increase of 11,830 tons in the quantity of ore milled, and working costs were reduced by sixpence per ton as compared with the previous quarter. The recovery value was about a shilling per ton lower, but notwithstanding this, the gross profit shows an increase of £3,033. The southern incline shaft was sunk 123 feet, and has reached a distance of 661 feet from the bottom of the vertical shaft. Connection has been made between the northern incline shaft and the vertical shaft. Development operations continued to disclose satisfactory values. At the State Mines stoping operations were continued at both the north-west and north-east shafts, and at the end of September the total ore stoped amounted to 25,620 tons of an assay value of 6·08 dwts. The ore reserves have been increased by 374,036 tons, and at the end of September were estimated to amount to 2,159,636 milling tons of an average assay value of 6·51 dwts.

THE GEOLOGY OF THE SWAZILAND COALFIELD.*—I.

Description of a Hitherto Neglected Field—Extent of the Coal Measure Series—Comparative Analyses of the Different Coals.

[By J. JERVIS GARRARD, F.G.S., M.Inst.M.M., Assoc.M.Inst.C.E.]

THE almost entire absence of any published description of the geological features of this portion of South Africa has induced me to place on record the following notes and geological sketch map and section as the result of cursory field examinations in this district from time to time. It is hoped that a gap between the Geological Survey of the Komatipoort coalfield by Mr. H. Kynaston and the Geological Survey of Zululand by Mr. W. Anderson will thereby be partially and provisionally filled; but it is not claimed that the data here given should be taken in the light of a final Geological Survey.

PHYSICAL FEATURES.

The area described comprises an elongated belt situated in the Low Country of Swaziland at an average altitude of about 700 feet above sea level, bounded on the east by the Lebombo Range, on the north by the Transvaal boundary, on the south by the Natal (Zululand) boundary, and on the west by a line approximately 30 miles west of the Lebombo Range, the total length from north to south being nearly 100 miles, but a portion of this belt lying about 25 miles north and 25 miles south of the boundary line between Zululand and Swaziland has not been mapped either by Mr. Anderson or myself. The country is almost entirely covered with bush, but very little undergrowth is apparent as a rule, giving a park-like general appearance in many places. The veld is considered to be unsurpassed anywhere in South Africa for cattle raising. The cattle are at any rate found to keep in most excellent condition even at the driest season of the year. The outstanding feature of the district is the Lebombo Range, which extends (with an approximate width of 10 miles) over the whole length of Swaziland from north to south, forming the boundary between it and Portuguese territory southwards as far as the Great Usutu River, and forming the boundary between Swaziland and Tongaland (Natal) south of the Usutu River. The wide top of this range has an average altitude of 1,500 to 2,000 feet, the highest point at Stegi being 2,527 feet. Seawards of this range the country is low-lying right to the sea, with the exception of occasional kopjes and low ridges of hills. Thus the traveller following the main road from Bremersdorp to the terminus of the Portuguese railway at Goba climbs from 2,000 to 2,500 feet in the first two miles, then gradually descends to about 1,400 feet in the next 16 miles, rising to about 1,800 feet near Malinda kopjes and dropping to 900 feet in the next few miles at the contact of the coal measures with the granite. Then the road remains approximately level for 12 miles to the base of the Stegi Hill, where the road climbs up to the top of the Lebombo Range and attains an altitude of 2,000 feet. From Stegi the general east-west direction of the road suddenly changes to a north-westerly direction, traversing the top of the range for 18 miles to the Portuguese border, whence the road descends for about seven miles to Goba, the terminus of the Portuguese railway from Lourenco Marques, at an approximate altitude of 300 feet. The country is drained by the Black Umbeluzi River in the north, the Great Usutu River, the Ngwavuma River, and by tributaries of the Pongola River in the extreme south, all these rivers running eastward through "poorts" in the Lebombo Range.

MAIN GEOLOGICAL FEATURES.

Overlying the older granite and allied rocks which occupy the country to the west of a line approximating to that of longitude 31 deg. 45 min., occurs a series of sandstone grits and shales containing coal seams and forming a belt approximately eight miles in width. The next belt consists of amygdaloidal basalts varying in width from two or three miles to seven or eight miles as far as the western slopes of the Lebombo Range. The next belt comprises the Lebombo Range itself, consisting of rhyolite, and eastward of the Lebombo Range cretaceous rocks occur to the sea coast.[1] Basic igneous intrusions in the form of sills and dykes occur in the coal measures and in the older granite, whilst an acid intrusion of granophyre occurs at the Mananga Mountains and also in the vicinity of Stegi, along the western edge of the Lebombo Range.

THE OLDER ROCKS.

The rocks upon which the coal measures are found to lie unconformably where noted in the vicinity of the Secupa Hill, Malinda Kopjes, and on the Umzimpofu River a few miles above its junction with the Great Usutu River, consist of grey granite and gneissoid rocks with numerous veins of pegmatite, whilst five miles west of Malinda hornblendic schists were noted, but so far the writer has not observed any rock analagous to the banded ironstones of Moodie's Series in this vicinity.[2] Neither have either the Table Mountain sandstones nor the dwyka conglomerate, which occur south of the Swaziland border in Zululand,[3] yet been noted here in the immediate vicinity of the coal measures.[4]

THE COAL MEASURE SERIES.

There is no doubt that these coal measures extend from the northern boundary line of Swaziland (Transvaal border) in an uninterrupted line southwards for at least 70 miles, and most probably join up with the coal measures mapped by Mr. Anderson in Northern Zululand (a comparatively small gap of 25 miles north and south of the boundary not having yet been examined). They certainly join up very closely with the measures mapped by Mr. Kynaston in the Komatipoort coalfield. The average dip in Swaziland is, however, only about five or six degrees, as against an average of 10 degrees in the Komati field (and 22 degrees in the St. Lucia coalfield in Zululand), but the thickness of the measures is very nearly the same as in the Komati coalfield, viz., 4,000 feet (as against 3,300 feet at Komati), the average width of the belt exposed being here about eight miles as against only three and a half miles at Komati, due to the flatter dip in Swaziland. The same irregular line of contact with the granite has been noted, but the entire line of contact has not been accurately surveyed.[5] The general strike of the measures is slightly east of true north, the direction of dip being seawards. The rocks constituting the series consist of alternating bands of sandstoned grits and shales, with occasional coal seams and intrusive sills and dykes of dolerite, whilst a narrow belt of fine-grained sandstones occurs at the top of these measures immediately underlying the amygdaloidal basalts. The fine-grained sandstones at the top of the measures have been particularly noted about two miles north of the Black Umbelusi River, on the right bank of the White Umbelusi River at a point known as the Hunters' Rocks some six miles above its junction with the Black Umbelusi River, near the Tembe road some two and a half miles from the foot of the Lebombo Range and at a point some ten miles north of the Great Usutu River. At the Hunters' Rocks a small kopje is formed of these rocks, which consist of huge rounded masses of fine-grained sandstone intersected by a coarse network of thin quartz veinlets. Further south towards the Great Usutu River the weathering of these rocks takes the form of rounded cavities eaten into the surface of the rock (similar to the form of weathering seen in the Black Reef sandstones at Sabie in the Lydenburg district). Underlying these rocks at this point yellow shales are found.[6]

COAL.

The first indication of the existence of coal in this district was the discovery of a large lump of coal in the river bed near the junction of the White and Black Umbelusi Rivers by the late Mr. Forbes many years ago, who in consequence prospected the ground and eventually obtained the Forbes coal concession from the King of Swaziland. Subsequent search led to the discovery of several outcrops of coal, on the Usultwana River (a tributary of the White Umbelusi River), on the Lubuga (a tributary of the Umtintegwa River), on the Umtintegwe River itself some three miles above its junction with the Great Usutu River, on the Umblatuzaan River close to its junction with the Great Usutu River, and on the Uhloya River near Malibe Kop some three miles south-west of the junction of the Hlatusi and Great Usutu Rivers. Thus the presence of coal has been noted by actual outcrops located to date over a length of more than 40 miles on the strike of the measures. No work has been done on these outcrops sufficient to indicate the true thickness or quality of the coal where exposed, but a series of boreholes and prospecting shafts and one main shaft were sunk by the Swazi Coal Company in 1897-98 at a point 26 miles south of the Transvaal border on longitude 30 deg. 45 min. and about four miles east of the Secupa Hill. This small area of a comparatively few acres in extent is therefore the only portion hitherto tested of this vast extent of coal measures in Swaziland, which probably embraces some 700 square miles of outcropping measures and some 1,200 square miles of coal measures altogether, including the low lying flats overlain by amygdaloidal basalts up to the foot of the Lebombo Range, but beneath which the coal measures undoubtedly lie.

(To be continued.)

REFERENCES.

[1] W. Anderson. 2nd Report, Geological Survey, Natal and Zululand, 1904.

[2] H. Kynaston. Geology of Komatipoort Coalfield. p. 11.

[3] W. Anderson. 3rd Report, Geological Survey, Natal and Zululand, 1907, p. 132.

[4] H. Kynaston. Geology of Komatipoort Coalfield, p. 14.

[5] Except at one point near the Swazi coal mine where I have just learnt from Mr. David Forbes that he has found a small patch of dwyka conglomerate and ecca shales immediately underlying the coal measures, and which he states to be exactly similar to the dwyka underlying the coal occurrences on his farm Athole near Amsterdam on the high veld.

[6] It would seem probable that these are the same sandstones as those mentioned by Mr. Kynaston in "Geology of Komatipoort Coalfield," p. 28, which he correlates with the bushveld sandstone of the Springbok Flats. See also H. Kynaston - Transactions of the Geological Society of South Africa, vol. x., pp. 31 35.

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[*] A paper read before the Geological Society of South Africa on 9th November, 1914.

THE BELGIAN MINES IN AFRICA.—II.*

Further Details of Progress and Working Costs at Tanganyika Copper Mines.

[By ROBERT WILLIAMS.]

M. JADOT'S RECENT SPEECH.

I may here quote a few remarks from the able speech of Jean Jadot, chairman of the Union Miniere du Haut Katanga, in which this company is so largely interested, and made a few days ago in Brussels. This speech reads as follows:—"With regard to the mines, I have very little to add to the information contained in the directors' report. The two steam-shovels, with a capacity of 200 tons per 10 hours of work which started working at the Star mine in January, are giving entire satisfaction. At the Kambove mine we shall start working in a few months' time—at the end of January, perhaps—with two steam-shovels with a capacity of from 500 to 600 tons, these being much more powerful machines than those at the Star. The results of the prospecting carried out during the last financial year and during the last few months very largely confirm, both as to quality and quantity, the early estimates, of which shareholders had been reminded in a previous communication. The data collected in proportion as our mines were developed very largely confirmed what was known on the subject of their richness. There are still only three mines working; the others will be developed in proportion with our resources in labour and with the progress of the work. Concerning the tin mines, we have made some experiments in working at Busanga. In order to develop them and to arrive at normal working, it is necessary for the railway to arrive near to these mines; in a few months it will be as far as these mines—that is to say, at a distance only of 60 kilometres, which is a very little matter compared with the distances dealt with when we were prospecting. It is also necessary for the labour from the north of the Bukama district to be able to arrive by railway to the mines. Therefore, prospecting has specially been carried on, and the result of these missions confirms previous estimates concerning Busanga from the point of view of richness and tonnage, which were formed as a result of the first investigations. The following will indicate the progress of our metallurgical work: Production of copper, from January 1 to June 30, 1914, 42 days' work with one furnace; 122 days' work with two furnaces; three days' work with three furnaces, which corresponds to 295 days' work with one furnace. The production for this period was 4,520 tons of bars, containing on an average from 96 to 97% of copper, and 100 tons of matte containing 65%. The average production per day furnace was 15½ tons. Note—Since that date (June 30) the three furnaces have been working well and uninterruptedly.

COST OF COPPER PRODUCTION.

The average cost of production in 1913 of the ton of copper on truck at the works was 800 francs—that is £32 (7.18c. per lb.). The average cost for the first six months of 1914 was 778 francs (7c. per lb.). This price was found to obtain during a period when work was comparatively reduced, if it be compared with that registered since three furnaces had been working. We had anticipated an average cost of 700 francs per ton (6¼c. per lb.). This cost will certainly not be exceeded by the average cost for the financial year 1914 now in progress, because during the second six months the production will be higher than that of the first six months and will be recorded under more economical conditions. The probable production for 1914—we say probable because we must always take into account occurrences of every kind—will be from 10,000 to 12,000 tons of copper instead of the 7,000 tons in 1913. To the above-mentioned cost of production calculated on truck at the works must be added the cost of transport from Elisabethville to Antwerp, cost of handling, sale, etc., which gives as the probable cost of production at Antwerp for 1914, in round figures, about £40 per ton (9c. per lb.) Please note that this price does not include general European expenses carried to the profit and loss account, which amounted in 1913 to £18,000.

PROGRESS AT THE MINES.

"We are engaged in realising a vast programme of enlargement of our metallurgical works at the Lubumbashi, especially by the addition to the three existing furnaces of four new furnaces, which we hope to see working about June or July, 1915. If this hope be realised, our production for 1915 may be from 20,000 to 24,000 tons of copper. Naturally, this increase in production will have a very favourable effect upon the cost of production: the more the production increases the most the cost of production diminishes. We do not lose sight of the question of the mechanical preparation plant about which I have spoken to you previously. The question of the mechanical preparation and concentration of our ores is a very important one. We have decided upon the construction of a small experimental works built to prepare 50 tons of ore per day; further, this plant will be equipped for the investigation of different new processes which have been suggested to us for the treatment of the ores. This plant is ordered and is on the way to Africa, where it will be erected in a few months' time. The question which is of equal importance to us is the question of fuel. We have not ceased to give it our attention. The two batteries, each of 22 coke ovens, were fired, and first in December, 1913, and the second in March, 1914. Their capacity for production is 3,000 tons per month. They ensure the working of two water-jacket furnaces, and fulfill our expectations. With a view to obtaining all the coke required to supply the new plant, we have entered into a very satisfactory agreement with the Wankie colliery. We have obtained a notable reduction on the transport rates for fuel on the Rhodesian railways. The question appears, therefore, to be settled on excellent terms. The year 1914, during which we shall have working coke ovens, three water-jacket furnaces, and a mechanical preparation plant, and during which we shall have commenced the construction of the new smelting plant, including four new blasts-furnaces, shows signs of being one of importance in the history of the Union Miniere du Haut Katanga. We pay a tribute here to our staff, both in Africa and Europe, which has not failed to show us its devotion. In order to ensure under the best possible conditions the carrying out of our vast mining and metallurgical programme, we have obtained the services of a consulting engineer, A. E. Wheeler, a man of great experience, who left a very exalted position in the copper industry in the United States in order to collaborate with us in the realisation of the great work we have undertaken. Mr. Wheeler at the present time is making a thorough study on the spot of our mines and works; in fact, we can confirm what we told you in December last. The principal difficulties encountered since the beginning of our undertaking are to-day overcome. One, however, still remains, and one which is not the least serious, which you know has had our attention for a long time; it is the question of native labour." M. Jadot, in finishing his speech, made the following significant statement with regard to railways:—"The Benguella-Katanga railway, the construction of which is being pushed on in Angola, is to connect this territory with the mining regions of the colony, and is included in the Belgian programme of the Colonial Minister. It would thus be a powerful element in the industrial development of Katanga, ensuring with the Katanga railway and the Bas-Congo Katanga railway—in complete accord with those two lines—the enormous transport which will result from the development of the great mining wealth of the southern part of the Congo."

THE FUTURE.

Last year the copper output was 7,000 tons. Now I am going to predict to you the future output of copper, cost of same, and profits. I believe, from all the statistics I have read, and given fair conditions of labour—and at present these look promising—that the copper output and costs of the Union Miniere company will be about as follows:—For 1914, 12,000 tons at £38 (7¼c. per lb.) landed at home; for 1915, 25,000 tons at £30 to £32 landed at home; for 1916, 40,000 tons at about £30 (6½c.). The profits on these outputs will, of course, depend on the price of copper, but there is no indication that it will fall below present prices. Now, if copper prices are maintained, then the Union Miniere company must earn something in the neighbourhood of £1,800,000 to £2,000,000 sterling in profits in the next three years, of which we are entitled to about 40%, after allowing for depreciation and other deductions. I may further tell you that if the negotiations I am now carrying on are signed in their present form this company and the Zambesia company will receive debenture interest at once from the earnings of the railway, as about £390,000 will be earned within two and a half years in carrying construction material alone, according to Pauling & Co.'s contract. If people ask you how we are financing or are likely to finance, just quote these figures to them and tell them that although our assets figure as stated in the report at £3,545,831, one of them, which is given at a cost of £392,000 in the above figure, is worth to-day on the market about £3,000,000 sterling, which is equal to your whole share and debenture capital.

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*This address, delivered at the annual meeting of the Tanganyika Concessions, Ltd., London, July 22, in view of the importance of Belgian developments in Africa, is of so much interest that we reprint it almost in full.

The shareholders of the Knysna Lignite Syndicate, Ltd., have resolved that the company should be wound up.

Modern evolution in coke making is not only in the steady substitution of the retort oven, and its recovery of the valuable contents of the coal other than coke, for the wasteful beehive; it means also the shifting of the coke-making industry from the vicinity of the mines to the centres of manufacture and population, where the gas may be utilized and the other by-products disposed of at a profit. The extent to which this shifting of the coke-making industry has already taken place is evinced by the statistics of production in West Virginia where there are few coke consuming enterprises.

THE IMPROVED VENTILATION OF THE MINES OF THE RAND.—II.*

Work of the Past Six Years Reviewed and Examined.

[By JAMES WHITEHOUSE.]

SPEAKING on Mr. Pile's paper on ventilation before the South African Institute of Engineers, Mr. J. Whitehouse, manager of the Village Deep, said that on reading this paper he noticed that it rather gave the impression that the subject of ventilation was almost foreign to the Rand gold mines, which he considered was entirely a wrong one. The majority of mines at any rate were doing a good deal in this direction and were very well equipped. The author had suggested that Dr. Haldane should be invited to visit the Rand and show the engineers of these fields how to ventilate, but he was quite sure that Dr. Haldane would not care to undertake this work, since it was not quite his field. He had confined his attention more to the results of bad ventilation and dust, rather than to the equipment necessary to overcome these evils. He, the speaker, knew that in the field in which Dr. Haldane had been working, very much higher temperatures had been experienced than on the Rand, in fact, greater temperatures than we are likely to have for many years to come. In the Dolcoath Tin Mine where the rate of increase in temperature is 1 degree Fahrenheit for every 60 feet of depth, he recently came across temperatures greatly exceeding anything he had experienced on the Rand. If those things existed to-day where Dr. Haldane had been working for years he, the speaker, thought it unlikely that very much good would arise from Dr. Haldane's visit. The author had stated in his paper, "these underground fans, commonly known as 'dust disturbers,' are in most cases wastefully employed and are wholly inefficient." In the first place, it would be interesting if the author would explain the difference in effect upon dust caused by a fan placed at the top of an upcast shaft, as against one placed at the bottom. It is difficult to see why one should be a greater dust disturber than the other. Further, some figures showing cases of fans underground being wastefully and inefficiently employed would be of interest, since the speaker's experience with fans installed underground had not shown this to be the case. Again the author had said: "The reasons for making upcast shafts circular in shape and smooth-lined is to reduce the friction of the air. Contrast this with a fan discharging into the bottom of an old disused shaft, with an uneven perimeter, and you descend from the sublime to the ridiculous." They knew very well that the best results were obtained with smooth lined upcast shafts, but since these did not exist on most mines, and since it was not economically possible to have them, he thought they were quite justified in placing the fans where they were required, and where they were going to give the best results. Whether the rock happens to be irregular near the fan outlet or not is of little consequence, because the amount of friction over a short distance would not make any appreciable difference, and it was for the engineer to decide in what manner he would best obtain the desired results, and it usually proved economical to overcome the existing drawbacks on old mines by the use of a little extra power, instead of incurring large expenditure in providing ideal conditions to obtain the same result. Dealing with the subject of blowers, the speaker said that blowers were only used in this country for ventilation of isolated spots which could not be reached by the ordinary ventilation of the mine, and that was exactly the same means of ventilation which was used in coal mines in England. Mr. Pile referred to an instance—which was undoubtedly that of the Village Deep and Village Main Reef of the passing of the air from a deep level into an outcrop mine, and using the outcrop as the upcast for the deep level. Very much better results have been obtained in this way than in separating the two mines and making two ventilation installations, since in both mines the area of any one shaft is not sufficient for the purpose of upcasting the large volume of air required unless an enormous water gauge were used. With the present arrangement there are three downcast shafts on the deep level, and the area of all the small shafts on the outcrops mine is available for upcasting. Owing to the large quantity of air circulated, that passing into the outcrop mine from the deep level, is very free from dust and CO_2, as is shown by the tests made from time to time. The speaker thought he would like to draw the attention of members to that point, since the paper indicated that the results obtained were bad, which is not the case.

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*Being a contribution read before the South African Institute of Engineers on Mr. W. Pile's paper.

"SAFETY FIRST": LESSONS FROM CANADIAN COPPER CO. DEPARTMENT OF SAFETY.*

[By E. T. CORKILL, Safety Engineer.]

IN July, 1913, the Canadian Copper Company organised a Department of Safety, for the purpose of accident prevention. The work of this department is largely in charge of the safety engineer, working in conjunction with the Central Safety Committee. This committee consists of the following: President, Vice-President, General Superintendent, Superintendent of Mines, Smelter Superintendent, Chief Physician and Safety Engineer. The general superintendent is chairman of the committee, and the safety engineer secretary. Meetings are held during the first week of each month for consideration of the monthly accident report of the safety engineer, and recommendations brought forward for accident prevention. At these meetings the accidents occurring during the month preceding are discussed, and ways and means devised for the prevention of similar accidents wherever this is possible. In addition to this Central Committee, Workmen's Safety Committees have been formed throughout the different departments. These committees consist of from five to seven men, depending on the size of the department, and meet every two weeks. The safety engineer meets with these committees and keeps a record of all their recommendations, advising them at a subsequent meeting as to the disposition of these recommendations. Since the organisation of these committees many recommendations have been received and fully 90 per cent. have been carried out. The work of these committees from the smelter, mechanical and transportation departments has been exceptionally good. The mines committees have not been so successful, owing to the preponderance of foreign labour. The duty of each committee is to take note of defects in machinery, buildings, methods of working or handling material, or of any conditions throughout the work which may be the cause of accidents to employees. Each member of committee is allowed the necessary time from his work to attend these meetings, and if he is on another shift he is allowed three hours time for attending. Reports are made out by the doctor for every accident case he attends, giving date, nature of accident and probable period of disablement. This report is forwarded to the safety engineer. A notice is also sent by the doctor when the man is able to resume work, and a card also filled out and given to the injured person to be presented to foreman or timekeeper, giving the date the man is allowed to resume work. A foreman's report is also made out and forwarded to the safety engineer, giving full particulars of each accident. In this manner a full and complete record is obtained of all accidents that necessitate a workman laying off work. As an encouragement to the men, and to stimulate interest in the safety work, a pennant is awarded to the building at the smelter that has the lowest accident rate for the month. A pennant is also awarded the mine that has the lowest accident rate. A comparison of the accident rate for the year beginning July 1st, 1913, when the safety department was created, and ending June 30th, 1914, with the corresponding period of the preceding year, shows the following: Number fatalities per 1,000 men employed—1·98 or decrease of 74·7 per cent. Serious accidents per 1,000 men employed—18·2 or decrease of 35 per cent. Minor accidents per 1,000 men employed—69·7 or decrease of 18·3 per cent. The present system of having a doctor's report made out for every accident insures the reporting of every accident by the foreman to the safety engineer. Before the safety department was formed a large number of minor accidents were not reported. The decrease of 18·3 per cent. in these accidents should, therefore, be much greater.

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*From report of T. H. Sutherland, Chief Inspector of Mines of Ontario, July, 1914.

Glynn's Lydenburg.

The following are the particulars of this company's output for the month of October, 1914:—Tons crushed, 4,040, yielding 1,821 fine ozs.; estimated value of month's output, £7,716; estimated profit for the month, £3,751.

Producers of wolfram will have read with satisfaction the recent cablegram from London, stating that, with the help of the British Government, a factory in Yorkshire for extracting tungsten from its ores is being rebuilt, in order to give an outlet for wolfram, for which previously Germany had been the only market.

Rhodesian Section.

GLOBE & PHOENIX: VISITING DIRECTORS' REPORT.

Estimates of the Ore Reserves.

THE Globe and Phœnix Gold Mining Company, Ltd., have issued to the shareholders the report of the visiting directors, Messrs. Macquisten and Howard, dated October 8. Dealing with the ore reserves, the report states: "The estimates of reserves of ore on your property have always been very conservative, both in tonnage and value, and they have hitherto been more than borne out by the final milling results. In our opinion, therefore, you may accept the estimates of your reserve ore—which, in quantity, is as great as ever it has been—as being well within the results to be ultimately obtained therefrom. These reserves have had their ups and downs; but your mine, during its long history of nearly twenty years, has never ceased to develop payable ore, and that which was being developed during our visit is as rich as any which has been found in any period of the past, and there is sufficient of it in sight to provide for a good many years to come, even were the present developments to cease for a time to be in payable ore, a contingency not to be anticipated. The whole country round about is auriferous, and has been subjected to mere surface scratchings by prospectors. Out of the 14 blocks of claims belonging to your company only the individual blocks known under the specific names of the Globe and Phœnix blocks have been developed and worked. It is meantime impossible to say if any of the other claims contain payable ore. A little surface trenching has been done on a few of them. Subject to the approval of your board, we authorised the engagement of a skilled prospector to examine thoroughly and do further trenching and development work on such of your claims as he might deem most advisable after consultation with your expert staff. The expense of this investigation will not be great, and whether any results accrue or not, we shall thereafter have a better idea of what may be in these claims." With regard to the sands plant, it is added that there is on the surface a huge dump of sands accumulated during the past working of the properties. It is estimated to contain fully 6 dwts. per ton—richer than the ore of many a Rand mine. There should be approximately £400,000 of gold contents in this dump. With this plant in operation practically the whole of the contents of the ore can now be recovered. There is a substantial profit even on the present turnover of sands, and an increase in the amount treated by the addition of another roasting furnace, while adding little to the extra cost, will greatly increase the net profits from this plant and enable it not only to overtake the dump, but concurrently to treat the current sands Messrs. Marquisten and Howard report that, owing to the terms of the British South Africa Company's recent report on the sanitary conditions of the mine and native compound, they had anticipated finding these in an unsatisfactory state. They found, however, the conditions to be entirely the opposite of that report. The sanitary conditions of the mine are excellent. They examined carefully the compound, which had also been adversely criticised as defective and insanitary by the same authority. In their opinion it will compare favourably with any model lodging or Rowton House. The company's principal water supply is pumped from the Sebakwe River, about six miles away. The dam there is to be heightened. The river has been long dry, and the rain is anxiously awaited. The visiting directors suggest the storage of the rainfall in Rhodesia—where the fall is ample if conserved—as being the proper outlet for the Chartered Company's activities. The country could grow any crops if water could be had, and their assets would be greatly augmented. After this year's capital expenditure is complete they consider that, with the exception of the additional roasting furnace referred to, the property will be fully equipped, and abnormal capital outlay ceasing to be incurred, the company's cash position must benefit accordingly. In conclusion, the report states: "New shareholders who are unfamiliar with the past history of this company may be interested to know that the company's capital of £200,000 is the original figure. This is a small capital relatively to the magnitude of the company's operations and to those of other Rhodesian mining companies. There have been no borrowings, and although capital expenditure in mine equipment and development has been paid out of past revenue to an amount equal to four times the nominal capital of the company, shareholders have had paid to them a sum equal to eight times that capital in dividends. There are nearly 3,000 of the general investing public on the share register, who, in our opinion, having regard to the past history of the property, to the developments, and to the reserves, have an assured future for their investment for a considerable number of years."

Crescens (Matabele) Mines.

The directors of the Crescens (Matabele) Company announce in their report, just issued, that they propose to declare a dividend of 5 per cent. (6d. per share) in respect of the year ended the 30th June last. This is the first distribution of which the shareholders have heard since they received payment in July, 1911, of a dividend of like amount. The accounts for the last financial year show a profit of £4,570, whereas the credit balance for the preceding twelve months was only £57. There will remain, after various appropriations, £750 to be carried forward, as against the amount of £3,400 brought in. The improvement shown is chiefly due to sales of land having yielded much more than before, although the rents received by the company were also on an increased scale. The chairman of the company, who recently visited Rhodesia, takes a cheerful view of the outlook as regards the demand for land. He reports "general and pronounced optimism as to the future," in spite of the drought of the past three seasons and the natural depression caused thereby. He adds that there are constant inquiries for farms from day to day, and he is satisfied that "if a fair rainfall occur in the coming rainy season, and the progress of the war is satisfactory, we shall see an increased demand and rising prices. During the year 50 claims were abandoned, and subsequently a further 55 claims were also abandoned, and acting on the advice of Mr. H. A. Piper, the directors have given instructions to abandon the remaining Veracity claims when current protection expires.

Mining Magnates and the War.

The London papers state that Mr. Bernard Eckstein, son of the chairman of the Central Mining Corporation, has joined the Inns of Court O.T.C., and that Mr. Ludwig Eckstein, son of the late Herman Eckstein and Mrs. Cobbold, was recently invalided home from India, where he served in the 17th Lancers. Mr. Max Michaelis has a son in the Garrison Artillery in Ireland, and Lieut. Cecil Neumann, eldest son of Sir Sigismund, is in A squadron of the K.O.R.R. of the Norfolk Yeomanry. Sir Lionel Phillips made an offer some time ago of a whole wing of Tilney Hall, with 80 beds and accommodation for staff, for recuperating wounded officers. Tilney Hall is an ideal spot near Winchfield, Hants. Mr. Eckstein has placed Ottershaw Park at the disposal of the War Office for the same object, and Sir Sigismund Neumann offered his well-known Norfolk Estate, Raynham Hall, for 60 patients and nursing staff, with the entire expense to be borne by him. Mr. Solly Joel's yacht "Eileen" is under offer to the Admiralty. Lord Harris is doing great work in his county, where his son and heir, the Hon. Geo. St. Vincent Harris, is an officer in the East Kent Yeomanry. Amongst other directors of the Consolidated Gold Fields having sons in the Army or Navy are Colonel Frewen, one of whose sons is an officer of the 6th Royal Fusiliers and another a commander in the Navy; Sir Leigh Hoskyns, Bart., who has a son in the Royal Welsh Fusiliers; and the son of the late Mr. H. W. H. Dunsmore is also in the Army.

A correspondent of the *Daily Telegraph* reports that the Germans have created havoc and destruction in the coal mines in the north of France. Fighting has taken place round the coal pits, and the enemy previous to their retreat are trying to leave nothing but waste and ruin behind them. He further states that the entrances to three of the biggest mines in the Courrières district have been destroyed and all the machinery blown up.

UNION GEOLOGICAL SURVEY: ANOTHER YEAR'S WORK.—III.

Report by Mr. H. Kynaston, Director—Distribution of the Field-Work—Summary of Results—Good Progress Made—Further Rand Conclusions Deferred.

Additional problems, both geological and petrological, will be found in the rocks of the N'Kandhla Range, which consist of a very varied series of schists, amongst which quartz-schists, sericite-schists, and cyanite-schists may be recognized. These, especially in the forest area, have been deeply decomposed, doubtless owing to the long retention of moisture by the soil protected by the thick covering of vegetation. On the south-west side of the N'Kandhla Forest gold has been worked at N'Kuzana, the reefs consisting of small sheared quartz veins, usually several together constituting a single "reef," the country rock being for the most part composed of highly schistose sericitic and chloritic rocks. As one proceeds from here down to the Tugela Valley at Middle Drift, the fine-grained sericitic type of schist gradually gives place to dark hornblende-schists, which extend down to the river, with occasional intrusive patches and veins of granite and gneiss. About three miles down the river from Middle Drift a coarse phase of the igneous rock forms a conspicuous and sharp ridge of hornblende-gabbro, often showing remarkably coarse pegmatitic patches and bands. Associated with this gabbro there is a band of magnetite rock, striking in a general east and west direction. Its thickness is not clearly seen, but is probably between 20 feet and 30 feet. A partial analysis of samples of this rock in the laboratory of the Geological Survey showed 12·4 per cent. of titanic oxide in one sample and 14·9 per cent. in another. The rock closely resembles the titaniferous magnetite occurring in association with the norite of the Transvaal. Between Middle Drift and Fort Yolland large patches and belts of serpentine appear among the hornblende-schists, and both rocks are occasionally traversed by bands of granite and aplite, often with a very dyke-like behaviour. Chrysotile asbestos is frequently found in association with the serpentine, and has been worked for several years at Isitilo, about eight miles from Fort Yolland. It occurs as narrow veins in the serpentine, individual veins sometimes attaining a width of about 5 inches. The fibres of the mineral, however, do not reach this length, as they are nearly always affected by small cross-joints, and are somewhat brittle. A good silky variety also occurs, but there is very little of it. The mineral is worked by means of adits driven along the strike of a series of parallel veins, the product, which is shipped to the English market, being quite a fair class of asbestos, with a moderate length of fibre. A few miles to the north of Fort Yolland the hornblende-schists are succeeded by mica-schists with bands and veins of foliated granite and gneiss. Irregular veins, lenticular patches and pockets of coarse pegmatite traverse these schists, made up of white felspar and muscovite. In one place prospecting has been carried out on the mica. It occurs here in "books" a few inches in thickness, and averaging about 2 inches to 3 inches in width, but occasionally having a width of 6 inches or 7 inches. The material, however, is not of a promising character, as, although of good colour, it is frequently cracked and bent, owing to the movements to which the pegmatites have been subjected. In the neighbourhood of Eshowe there is a considerable area covered by the Table Mountain Sandstone Series, consisting of reddish felspathic sandstones and grits and reddish purple shales. In the Umhlatuzi Valley to the north these are succeeded by Ecca shales, which a short distance further north are seen to be bent up and apparently faulted against the older schists. This is said to be the northern side of a big trough fault, which traverses the greater part of Natal from west to east, and has here a downthrow of about 100 feet. It is shown in the Geological Map of Natal, compiled by Mr. C. Grey and published by the Mines Department. Close to Melmoth the Dwyka is seen resting upon denuded Table Mountain Sandstone, and is also seen to be faulted against it. West of Melmoth occurs a small patch of the older schists, well exposed at the Vira Mine. They are mostly reddish, very decomposed sericite schists, with thin quartzites and some micaceous shaly rocks, and occasional belts of serpentine. These schists are capped by purplish felspathic sandstones and shales of the Table Mountain Series. Gold has been worked at the Vira Mine in small quartz reefs, but the workings have lately been closed down. Another good section showing the Dwyka Conglomerate and Ecca beds faulted down against the Table Mountain Sandstone may be seen at Sydenham, just outside Durban, where the fault-plane, together with a layer of hard silicified breccia which accompanies it, forms part of the north face of a conspicuous kranz overlooking some coolie gardens. The Table Mountain Sandstone here consists of rather coarse, felspathic, reddish, and purplish sandstones, frequently very pebbly. Close to the fault there are some large and numerous small quartz veins, showing much secondary silicification, and small quantities of gold have been found in association with these veins. At the beginning of November an examination was made, in company with Dr. Humphrey, of the beds known as the Pongola Series, occurring near the junction of the Pongola and Pivaans Rivers, in the Vryheid District. If these beds can be correlated with Insuzi and Buffalo Series of Zululand, then it follows that the thick series of amygdaloidal rocks form the bulk of the Lower Pongola beds must represent volcanic material of comparatively local development. The Upper Pongola Series bears a general resemblance to the Zululand rocks, but the quartzites of the former are on the whole considerably thinner, and there is a greater development of shales. The stratigraphical position of the series has been discussed by Dr. Humphrey in the Report of the Geological Survey for 1912, page 114.

(5) *Cape Province.— (a) Namaqualand.*—Dr. A. W. Rogers spent five months in north-western Namaqualand, where he surveyed 3,697 square miles, including 962 miles of geological boundary lines. The country consists of gneiss, overlain on the eastern side by outliers of the Nama formation showing only slight disturbance, and on the western side by what is probably the same formation, but showing in addition a series of higher beds, in a sheared and highly folded condition. These western beds, together with the older gneisses, have been invaded by a large mass of granite. The Karroo System is represented by outliers faulted down in the Orange River Valley at an altitude of about 400 feet above sea-level. A number of copper prospects were examined, both of the magmatic type, as well as veins with a quartz gangue.

(*b*) *East Griqualand.*—The area mapped by Dr. du Toit comprises a portion of East Griqualand and the Alfred County of Southern Natal, and joins up with the work of Mr. W. Anderson in 1905 and with that completed by Professor E. H. L. Schwarz in 1902. The various sub-divisions of the Karroo System were traced northwards into Natal with a distinct decrease in thickness in that direction, and it was found that the zone termed by Anderson "Upper Ecca" corresponds to the Lower Beaufort beds, as has been suspected for some time upon palæontological grounds. Several traverses across the Karroo formation in Natal make it probable that the Coal-measure Series of Natal is of Beaufort age—probably Lower Beaufort—which is in harmony with most of the available evidence in the Transvaal. The strata are cut by numerous dykes and sheets of dolerite with a gabbroid phase in the Ingeli Range, where there is also a well-marked development of picrite. A peculiar graphite-bearing rock has here resulted from the interaction of norite and Ecca shale. A few Kimberlite occurrences were investigated by Dr. du Toit, and these are of great geological, if not of economic, interest. The geology of the eastern portion of Alfred County was described by W. Anderson in the Third Report of the Geological Survey of Natal and Zululand (1907), page 105.

American Diamond Imports During War.

The imports of precious stones into New York for the week ended October 16, consisting chiefly of diamonds, are, according to the Government's returns, valued at 156,000 dollars. This compares with 82,000 dollars in the previous week, with 172,000 in the corresponding week last year, and 370,000 dollars two years ago. The following are the weekly totals, with comparisons with the two previous years:—

	1914.	1913.	1912.
	$	$	$
August 6	718,000	1,246,000	836,000
August 13	616,000	980,000	609,000
August 20	242,000	1,078,000	1,147,000
August 27	269,000	695,000	574,000
September 3	152,000	1,301,000	688,000
September 10	141,000	1,174,000	1,309,000
September 17	24,000	334,000	653,000
September 24	338,000	2,256,000	462,000
October 1	70,000	1,617,000	1,284,000
October 8	82,000	656,000	920,000
October 15	156,000	172,000	370,000
Totals for current year	17,300,000	40,843,000	30,710,000

Royal Mint Report.

The Deputy Master, Sir Thomas Elliott, in his annual report states that during 1913 over 185 million coins were produced, this figure being upwards of 14 million more than in 1912, the previous highest total. Of this number 150 million were for Imperial issues and 35 million for Colonial requirements. The Imperial coinage was made up of 30½ million gold, 32½ million silver, and 87 million bronze pieces. The bronze figure exceeded that of the previous year by 10 million, and is the highest on record. The year's operations resulted in a net profit of £670,945, as against £1,243,576 in 1912, the decrease being due, principally, to the reduced demand for silver coin during the period under review.

A healthy confidence in one's own country and its resources is by no means incompatible with readiness to seize the chance of a profitable speculation elsewhere, as Mr. Chris. Watson, the first Labour Prime Minister of the Commonwealth, doubtless argued when he abandoned all that the Federal Parliament contained for him to go gold-dredging with New South Wales capital, in South Africa, says the *Monthly Journal* of West Australia.

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Engineering Notes and News.

ROCK DRILL AIR CONSUMPTION AND COSTS.

Reply to Discussion by Messrs. Izod and Laschinger—Experimental Apparatus for Further Study of the Problem.

THE most notable contribution to the proceedings of the South African Institute of Engineers last Saturday night was the closing of the discussion on "Rock Drill Air Consumption and Costs" by the joint authors, Messrs. Izod and Laschinger, of the Corner House. Mr. Izod read the reply, in which, *inter alia*, the authors said:—

In reply to Mr. Vaughan's query as to the method adopted in bringing drills down to a standard rating of the 3¼in. size, this, as explained in the original paper, was based upon approximation by taking into consideration not only diameter and stroke, but also air consumption tests and the authors' experience of rock drills. The method of assessing the relative air consumption of different drills in reducing them to the arbitrary standard is admitted to be somewhat crude, but some uniformity was necessary in order to institute comparisons. A better and more scientific standard will no doubt be evolved, but no apology is needed for adopting the rough standard as one easily understood by engineers and mining men generally.

The question asked by Mr. Tregaskis as to how winches and pumps were brought down to the 3¼in. drill unit is partly answered above. The air consumption of a 3¼in. drill in normal operation has been taken by engineers on the Rand for many years as averaging about 100 cubic feet of free air per minute. For instance, compressors have been sold here for the last twenty years on drill rating, a small 25-drill compressor having a capacity of about 2,500 cubic feet of piston displacement per minute at normal speed, a 50-drill about 5,000 cubic feet, and so on. With such a basis the equivalent 3¼in drill capacity of winches and pumps is easily computed, and by a knowledge of running time, speed and size, of cylinders, the equivalent drill shifts were approximated. It may also be remarked that when the equivalent pump and winch shifts are a small proportion of the actual drill shifts (as is usual on Rand mines) even an appreciable error in the equivalent drill shifts on winches and pumps makes very little difference in the result, since the error is only a small fraction of the total work done.

Mr. Greer's remark as to wastage of air at the front head of reciprocating machines is very much to the point. During the tests made on individual drills at the Village Main Reef mine (as mentioned in the paper) this point was amply demonstrated. A machine with a well fitting piston and poor fitting front head may be as wasteful as a machine with a well fitting head and fairly slack piston. The secret of economy and good work in a rock drill is in having all the parts practically perfect. So far as air consumption is concerned, the fit of piston, front head and the valve are the three important factors. So far as eliminating piston rings is concerned, as suggested by Mr. Greer, this is a matter which further tests and experience will decide.

The contribution by Mr. Steele is very instructive, and gives valuable figures and data taken from the records of the General Mining and Finance Corporation group. His remarks that "he could not see any necessity for reducing work done by pumps, winches, etc., to the 3¼in. machine shift," is quite in order. It is not a question of "necessity" but of expediency. It would be just as correct and easy to obtain by measurement or calculation the total air used in winches and pumps, deduct this from the total air and to distribute the remainder to the actual drilling shifts. The whole question is one of choice only. To think in 3¼in. drill equivalents appeals to the mining man, and the authors chose this standard as being a convenient one. Mr. Steele also rightly remarks that the standard rock drill shift, as well as winch and pump shifts, have an actual value in ft. lbs. The value of underground machinery in ft. lbs. per shift would no doubt be very interesting to the scientific investigator and of value to an engineer studying efficiency, but it would be a "new one" to our mining friends. In view of the importance of the ft. lbs. study of rock drills and the dearth of information as to what work is actually available at the drill bit and where drilling machines may be increased in efficiency, the authors have in contemplation an experimental apparatus for the further study of the rock drill problem. Mr. Steele questions as to how various sizes of drills and winches and pumps were assessed in 3¼in. drill equivalents has already been answered, but it may be remarked that statistics are furnished from all the mines of the group, giving sizes, makes and particulars of work done by all drills, winches and pumps working underground. From these statistics the final figures are compiled. The object is to obtain the reasonable accuracy mentioned by Mr. Steele. To obtain a high degree of accuracy is no doubt desirable, and efforts have been and are being made in this direction, the question of cost, however, becomes important in this connection.

With regard to the advantage of single shift working, this question was not discussed in the paper, but its importance, so well brought out by Mr. Steele in his contribution, was specially dwelt upon in a report by one of the authors years ago. At the same time there is no reason to lay too much stress upon single shift as against double shift when it comes to economical use of air. In a well ventilated mine,

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where all pipes, machines, etc., are properly looked after and good supervision obtains, the efficiency may be just as good on double shift working as on single shift. The Village Main Reef mine is the only mine of the Central Mining-Rand Mines group working on full double shift at present, and in spite of that it is the most economical in air. The small black dots shown in Fig. 1 of the original paper represent the record of the Village Main Reef. With regard to the question as to which mines were on single shift and which were on double, the records upon which the diagram was prepared refer to the transition stage when the mines were gradually changing over from double to single shift, and therefore it is not possible to draw deductions on double or single shift from the diagram. With regard to Mr. Steele's figures as to air units per drill shift, it may be pointed out that there is a difference in favour of the air units consumed when the mine generates its air power with its own compressors. The central mines of the Central Mining-Rand Mines group purchase their air at an average pressure of 100 lbs. per sq. inch, and therefore there is less weight of air per unit than if the air were purchased and generated at 75 lbs. as in the case of the General Mining group of mines. If the Meyer and Charlton were buying the air from the Power Company at 100 lbs. pressure, the 86 air units per equivalent drill shift (assuming the same weight of air consumed) would become 98 units per drill shift. Mr. Steele's remark (p. 137) in saying that the low air consumption of 103½ cubic feet per minute for a drill is given in Table II. of the original paper, as against the maker's rate of from 127-130 cubic feet per minute was due to the friction of the drill in the hole is not the correct explanation. Exactly similar drills operating on the other mines where conditions were as nearly as possible the same, gave from 122 to 153 cubic feet of air per minute of drilling time. It may be remarked that it is only recently, and most probably due to the work done here on the Rand, that makers have realised the necessity of proper machine fit in rock drills, and are now supplying new machines with cylinders reamed and pistons ground to fit. The fact that a machine is new does not guarantee it to be efficient. The authors have conducted no further tests so as to try the effect of slack valves, etc., as suggested by Mr. Steele. The necessity of having all working parts a good fit has been demonstrated, and all the mines of the group have installed in the rock drill fitting shop a small air meter, so that any and every drill may be tested on the block, whether it be a new drill or a repaired one. Defects which cause high air consumption can then be investigated and rectified.

Metering the air is the most accurate method of arriving at the air consumption. It is agreed that it is almost impossible to eliminate air leakage entirely, but a study of the attached curve of the cost of air leakage is interesting as showing the waste of good golden sovereigns which it is possible to reduce by extra careful attention to this point. It is quite easy to believe that on a mine with a fair milage of air piping, there are sufficient small leaks (hardly noticeable individually) which would, if totalled up, be the equivalent of a hole 1in. in diameter. Assume that this leakage is continuous, *i.e.*, while the air pressure is on the pipes; this represents a net waste of 140 pence per hour or £1,750 per annum, assuming single shift working. The diagram annexed represents the loss due to leakage equivalent of various holes. Mr. Steele suggests the remedy for the high air consumption in many mines, and that is to have some responsible person or persons in charge of the air mains, etc., preferably under the control of the resident engineer. Mr. Steele asked whether under the contract system the contractor and his men's time were subject to workshop and supervision chargse; this is an important point, and the authors would state that all costs of labour, etc., are charged out at the full workshop hour rtae, including supervision charges, and all the costs given in the paper are inclusive of full overhead departmental charges. At the same time the contract with the rock drill contractor does not include all overhead charges, as it would obviously be unfair to debit a man with a percentage of standing charges on a department where he is controlling the expenditure on only a very small proportion of it. Mr. Steele also asked how many mines had reached the authors' suggested standard of 90s.-95s. for maintenance, including hose. The September return showed that two mines had reached this figure, one being down to 71s. per 52 shifts, the other showing 91s. per 52 shifts. The average of the first mentioned mine, namely, New Modderfontein, for the last six months had shown the particularly satisfactory figure of 89·5s. per 52 machine shifts.

Mr. Carr's figures as to drill maintenance shows that the system at the Simmer and Jack has been very good, and seeing that it has been in operation for such a long time, it is interesting to note that the results are almost identical with the authors' statements as to what the figure should be brought down to. The figures are: Simmer and Jack costs, 88s. 8d., as against that given by the authors of 90s. to 95s. per 52 machine shifts. The authors do not quite understand Mr. Carr's remark (p. 139) as to the reduced cost of the air on the mines quoted in the paper. The air is purchased at the rate of 0·525d. per unit. The savings are due to the less average consumption per drill shift alone.

Mr. Harris had suggested that it was advisable to look into the cost of rock drills, including new machines and this had been done, the figures given above of the two mines who had low costs included the cost of new machines. With regard to the same speaker's comments that the costs of spares for 1911 and 1912 (as shown by the Chamber of Mines report) had not perceptibly varied, the authors would point out that this figure was really no guide, as the machine shifts should also be taken into account. It was not possible to obtain a return of the actual machine shifts, but the following figures, taken from the reports of the Chamber, were interesting:

Year.	Cost of rock drill spares.	Drills at work.
1911	£180,039 0 0	4,671
1912	180,030 0 0	5,717
1913	161,839 0 0	5,753

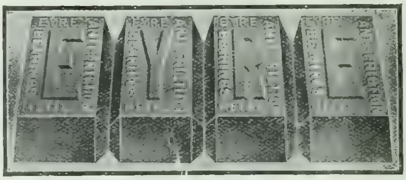
In connection with the matter of machine maintenance costs, the authors are now able to complete the 1913 table given on page 93 of the November Journal, 1913. The summary results are as follows:

Year.	Total rock drill machine shifts.	Actual cost.	Average cost in shillings per 52 R.D.M.S.
1911	£746,485 0 0	£126,622 0 0	176
1912	877,353 0 0	119,964 0 6	142
1913	890,003 0 0	104,029 0 0	122

These figures show that the reduction in costs are not only maintained, but are improved, as was anticipated.

Mr. Drinnan, in his remarks regarding shanking and fit of shanks in the drill chucks, touches an important point. There is no doubt but that even if a drill be perfect as a machine, a shank which throws the drill out of the line of its work and which clamps the steel eccentrically, is bound to cause poor drilling and extra strain on the machine. If, in addition, the shank does not fit the chuck, the operators will punch the wedge and "U" bolt by excessive hammering. With regard to the shanks of drill steel for hammer drills, it is the authors' opinion that these should also fit well and not be allowed to run with badly fitting shanks. Standardisation of chucks and shanks for different classes of drills is the remedy.

In conclusion, the authors wish to thank those who participated in the discussion for their criticism and new light thrown upon various phases of a subject which is one of such great importance on the Rand from financial and practical points of view.



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Commerce and Industries.

The Empire's Chance. A booklet dealing with the commercial aspect of the war now raging between Great Britain and Germany has just been issued by Messrs. Benn Bros., Ltd. It is pointed out in the preface that during the last decade, with increasing persistence, Germany has been encroaching upon fields of commerce in which previously everything was in our hands. Bringing science down from the aloof heights of theory, she has applied it to the economics of business, and the results, as shown in official statistics, have been phenomenal. But hitherto these results have had, comparatively speaking, little or no reflection in the trade of Great Britain. There has been no correspondingly increased effort on the part of Great Britain and the Colonies to hold their own. There is too much Micawber about us. "It's all right. Don't worry. Something is sure to turn up." Well, though so far as the moral is concerned it is a perilous thing to admit, something has turned up. That something is the war with all its immediate horrors, anxieties, perils. The war is the British merchant's opportunity. The purpose of this volume is to present a broad survey of the nature of German export business. The figures of German trade for each of the leading commercial countries of the world are set out in the hope that British manufacturers may, by reference to them, be able to form an idea as to where those lines in which they are interested are likely to be wanted.

* * * *

Trading with the Enemy. The Management Committee of the Capetown Chamber of Commerce has reported that it had been brought to its notice that efforts were being made by firms established in neutral countries, Holland and Sweden, to act as intermediaries for carrying on trade between Germany and South Africa. The first matter brought to notice was that of Messrs. Post Van der Burg & Co., of Rotterdam, inviting orders for German goods. This was brought by the Government to the notice of the Chief Censor, with a view to the discovery of any breach of His Majesty's Proclamations relating to trading with the enemy. The Secretary for Finance desired the matter to be brought to the notice of the Chamber, and inquired for suggestions which it was desired to offer for effectively dealing with the situation. The second instance was brought to the notice of the Chamber by a firm in Capetown, who had received a communication from a German firm domiciled in Stockholm, requesting that South African produce should be sent via Stockholm to and for the account of their firm in Hamburg, at the same time offering exceptional terms and high prices for produce to exporters from South Africa. This matter had already been brought to the notice of the Government, and suitable steps were being taken to prevent any such transactions being negotiated.

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P.O. Box 2154, Johannesburg.

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Trading with the Enemy. Much difficulty has been experienced by the business community both in South Africa and in England in deciding whether payments to the enemy should or should not be paid in certain cases. Messrs. John I. Thorneycroft & Co. cite a case which has occurred to them. This firm owe money to the Sheffield branch of the Poldi Steel Works, an Austrian firm. The Poldi Works applied for payment, and backed up its demand by a letter which its solicitor had received from the Foreign Office. The letter from the Foreign Office was in reply to the following questions put by the Poldi Steel Works: (1) Whether it is illegal in any way for British subjects to discharge in Sheffield debts already incurred or to be incurred in favour of the Poldi Steel Works (Sheffield branch). (2) Whether there are any steps, such as an application for a licence to trade, which would render the position of the Poldi Steel Works and those discharging debts to them more secure. The signatory of the letter from the Foreign Office in reply to these queries says:—"I am directed by Secretary Sir E. Grey to inform you that it would not be contrary to the Proclamation against trading with the enemy to trade with a branch of an enemy company locally situated in British territory. Payments for transactions with the Poldi Works at Sheffield could also be made, if desired, and no licence would in this case appear necessary." We understand that this position is to be tested in the courts.

* * * *

Iron, Steel and Engineering Trades. A striking manifesto has just been issued by the executive council of the Associated Iron and Steel Workers of Great Britain to the members of that organisation. The manifesto is headed "Our Duty During the War," and it declares that either we must win for the triumph of political and industrial freedom, or be crushed by a military despotism beneath whose iron heel all industrial freedom would be utterly destroyed. After a reference to the thousands of their fellow workmen throughout the iron and steel trade who have gone to hurl back the German despot, the council say:—"We also who remain have our great fight, and that is to capture, as far as we can, the German iron and steel trade built up by unfair, underhanded, and unscrupulous methods. The German nation would not only crush our Army, but would crush and cripple our industry. That is their aim! To beat them in the industrial fight is the great privilege of every industrial worker who stays at home. Now is the time, and now the opportunity which may never occur again. No throwing down tools—suppose 'Tommy' threw down his rifle? No stopping away from work—'Tommy' doesn't stop away from the fight, he's eager to be in it! We must be out to win. There is no room at the front for 'Weary Willies' and 'Tired Tims'—they take good care not to go. . . . Every reasonable difficulty can and will easily be dealt with by and through our association and Wages Boards—but they must be real! Don't manufacture or magnify them. Just as our workmates who have gone to the front, fight to conquer the vain German despot, so we at home must work to win and keep our industrial supremacy!"

The Opportunity for Local Industries.

The Secretary of the Natal Manufacturers' Association (Mr. F. J. Rowell) writes as follows:—"I shall be much obliged if you will give prominence to the enclosed circular letter which is being sent to merchants and others in this district, with a view to ascertaining, as far as possible, the goods which we have been in the habit of importing, but which are now unobtainable in consequence of the state of war. We believe that an opportunity exists for assisting local industrial enterprise, that many of these imported goods could be manufactured locally, and that the best means for ascertaining particulars in this connection is by holding an exhibition of the goods, as is suggested in the circular letter. Our thanks are due to the Principal and Council of the Technical Institute who are kindly assisting in the movement, and who have arranged for the exhibits to be on view at the Institute." The circular appeal is as follows:—"Dear Sir,—In consequence of the present crisis in Europe there are many articles, previously imported into this country, which are now practically unobtainable. At the same time it is possible, indeed probable, that a number of these could be made in this country if facilities existed for making known to manufacturers the particulars of the articles required. We think it is possible to turn the present disorganisation to good account by stimulating our local industrial activity, and increasing the production of the country. If this could be done, not only would a great deal of money hitherto sent overset be kept in the country and circulated here, but employment would be given to a large number who would otherwise be thrown out of work as a result of the war. The Natal Manufacturers' Association, in conjunction with the Pietermaritzburg Technical Institute, has accordingly decided to ask merchants, storekeepers and others to co-operate with us by sending us a list of articles difficult to import, together with any details they may think desirable, and the lowest selling price. If possible, a sample also is asked. An exhibition of the articles will be held at the Technical Institute. Manufacturers and others will then have an opportunity of examining the goods, and deciding upon the possibilities of manufacture. The articles may be sent direct to the Technical Institute. It is quite unnecessary, in a circular letter such as this, to enlarge upon the impetus which might be given to local industries in this way, the value to the Province of the new fields of industrial operations which might be opened up, or to the benefits that would accrue consequent upon the employment of a larger number of people. On these grounds we ask for your co-operation and assistance." The above is signed by F. J. Rowell, Secretary, Manufacturers' Association, and A. Seymour-Hosley, Principal, Technical Institute.

MINING MEN AND MATTERS.

Mr. W. L. White, of the Johannesburg Consolidated Investment Co., has returned to the Rand.

* * * *

The death occurred at Bulawayo this week of Mr. R. N. Hall, F.R.G.S., the well-known archaeologist.

* * * *

Sir Abe Bailey, like Sir George Farrar, is going to the front, having been appointed to a position on General Lukin's staff.

* * * *

The usual monthly meeting of the Chemical, Metallurgical and Mining Society of South Africa to-night will be signalized by the reading of a paper on the dust allaying plant at the Ferreira Deep dump by Mr. S. Newton.

* * * *

The death was recently announced of Mr. Gilbert Pearce, who was head of Messrs. Williams, Harvey & Co. at Hayle for many years. He was brother of Mr. Richard Pearce, who was so well known in Colorado as a pioneer in metallurgy.

* * * *

While the British Association was at Adelaide, a special congregation of the Adelaide University was held, when the degree of Doctor of Science was conferred on Sir Oliver Lodge, Professors Sollas, Penck and Edgeworth David, Dr. Juritz and others. During the Melbourne meeting of the Association, Dr. Juritz was elected a permanent member of its General Committee. The meetings, which were held at Perth, Adelaide, Melbourne, Sydney and Brisbane, were also attended by Dr. A. L. du Toit, of the Union Geological Survey, who has now returned.

* * * *

We regret to record the death, which occurred at Kimberley last week, of Captain Thomas Quentrall, who for a period of a quarter of a century was a well known and highly esteemed resident of the Diamond Fields. He was a native of Wendron, near Redruth, Cornwall, and as a mining engineer he carried out the tradition of his family, who were closely associated with the tin-mining industry of that country. He was appointed mining engineer at Kimberley on July 25, 1889, and was promoted to the position of Inspector of Mines for Kimberley on July 11th, 1891, and Inspector of Mines for Kimberley and Barkly West on August 1st, 1902. He covered a very large area in the course of his duties, and frequently paid visits to the Indwe coal mines, the Namaqualand copper mines, and other places far afield. Some time ago a very interesting duty fell to his portion, he being commissioned to visit and inspect the Guano Islands, off the coast off German South West Africa, and prepare a report on supposed diamondiferous deposits in that region. After performing long and valuable services in the capacities named, he retired from the active civil service on a pension a few years ago, and latterly had been enjoying a well earned rest.

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The Week's Company Meetings.

NEW MODDERFONTEIN.

A Wonderful Mine.

Mr. Schumacher's Review.

The seventeenth ordinary general meeting of the shareholders in the New Modderfontein G.M. Co., Ltd., was held on the 16th inst., in the Board-room, Corner House. Mr. R. W. Schumacher was in the chair, and among those present were Messrs. J. Andrew Cohen, J. H. Ryan, F. Raleigh, B. Moses, B. H. Davis, C. Meintjes, F. H. Barry, C. C. Beaumont, H. J. McCormick, W. L. Honnold, W. Dalrymple (representing Anglo-French Corporation Co.), G. Sonn, A. G. Gill, S. C. Black, J. R. Nicholson, E. A. Wallers, W. H. Dawe and H. C. Boyd—representing 104,390 shares out of 350,000 shares of £4 each.

Chairman's Speech.

The Chairman said: The results of the financial year ending the 30th of June last, showing as they do a profit of £559,214, must be considered good when we take into consideration that the period embraces the two strikes, that of July, 1913, with its disastrous effects on the supply of native labour, and that of January of this year. During the first eight months of the financial year, that is till the end of February last, the tonnage crushed at no time exceeded 41,500 tons, whereas the fully capacity of the mill is over 52,000 tons per month; only since March has the mine been getting into its full stride and showing what results can be expected when work is carried on under reasonably favourable conditions. But while the conditions that prevailed during the financial year under review were adverse and abnormal, we have to chronicle marked progress in more than one direction. The profit earned has enabled the company, after distributing two half-yearly dividends each of 12s. per share, absorbing in all £420,000, and after paying taxes, etc., to bring forward a balance of £230,114 on Appropriation Account at the end of June, 1914, as compared with the balance of £163,367 of the year before. The actual cash position of the company at the 30th of June, 1914, as explained in the report of the directors that has long been in your hands, shows a credit balance of £210,258, of which £68,247 is the remainder of the unspent working capital which was provided in 1910 for the extension of the milling capacity, and of the ore reserves. The biggest advance is shown in the ore reserves which on the 30th of June, 1914, were estimated at 6,334,500 tons of an average value of 8.4dwts., including pillars, as compared with 4,547,000 tons of an average value of 8.1dwts. at the end of June, 1913. It is interesting to note that only five years ago, at the end of June, 1909, the total ore reserves of the mine amounted to 1,564,000 tons, and that the average value was 6dwts. per ton. The steady increase that has taken place in the quantity of the ore reserves, and in the value, is of great significance.

Developed Tonnage.

During the year ending the 30th of June, 1914, the payable tonnage developed amounted to 1,990,400 tons of an average value of 9.2dwts.—a fine record. The tonnage stoped from ore reserves during the same period amounted to 471,523 tons of an average value of 9.5dwts. It will be seen that the ore stoped was slightly above the average value of the tonnage developed. It was found necessary, owing to extreme shortage of labour, to concentrate operations on those portions of the mine where the highest efficiency could be obtained, and these places happened to contain ore of a grade above the general average. Ever since the labour supply has enabled the mine to deal with a satisfactory tonnage, that is since March last, the grade of the ore mined has not been above the general average in fact it has been if anything, a little below. It may be interesting if I here give the following comparative figures dealing with the results obtained during the last financial year, and with those of the first four months of the current financial year, that is, July, August, September and October, 1914:

	Monthly average for July, August, September and October, 1914.	Monthly average for year 1st July, 1913 to 30th June, 1914.
Development footage	1,575ft.	1,210ft.
Waste sorted	16.2 p.c.	4.9 p.c.
Tons milled	52,250 tons	42,525 tons
Yield per ton ..	35s. 10.8d.	38s. 9.8d.
Working costs	14s. 10.1d.	16s. 10.8d.
Working profit ..	£54,996	£46,601

These figures speak for themselves.

Working Costs.

I turn for a moment to working costs. For the year ended June, 1913, when 7.3 per cent. of the rock mined was rejected as waste, the costs were 19s. 11d. per ton milled. For the year now under review, ended the 30th of June, 1914. during which the percentage of sorting fell to 4.9 per cent., the costs were reduced to just under 16s. 11d. per ton. Of the saving about 6d. per ton was due to an arbitrary reduction in the rate of development redemption, while about 2s. 6d. per ton was due to enonomies in mining operations. From the figures I have just given it will be seen that during the months July. August, September and October, 1914, working costs had fallen to 14s. 10.1d. per ton milled, while, at the same time, the waste rock sorted out had been increased to 16.2 per cent. The great reduction that has taken place in working costs is due to the fact that we have laid out the mine so as to be able to handle large tonnages efficiently and cheaply with a comparatively small labour force. We are now gaining the benefits of the heavy expenditure of the last few years; the mine is working at ease under favourable conditions, and is in a position to produce a much larger quantity of ore than can be treated by the existing reduction plant. The general tendency should be for working costs to show a further gradual decrease.

The Future.

I have been asked by various shareholders to give some indication of the results likely to be obtained by the mine in the near future, and to give some assurances as to the length of its life. I have pleasure in complying with the request as far as our knowledge to-day will allow. I will deal first with the current development which consists of 6,334,500 tons of an average value of 8.4 dwts. or 35.28s. per ton. To estimate the yield that will be obtained from these reserves it is necessary to make allowance on the one hand for the inclusion of rock from development faces and from other sources, which is likely to have a lower grade than the ore reserves—we estimate about 4½ dwts.—and, on the other hand, for the sorting of waste rock which takes place both underground and on the surface. We assume that, as long as our labour force is not unduly depleted, sorting will take place in the future at a higher rate than in the past, say, something between 15 per cent. and 20 per cent. We believe in the simple, commonsense principle of eliminating waste rock as far as is economically possible, and of replacing it by ore of payable grade that will yield a profit. A high rate of sorting will naturally have the effect of raising the value of the ore as it goes to the mill, and, taking all factors into consideration, our estimate is that the present ore reserves should yield an average extraction in the neighbourhood of 37s. per ton milled. I must ask you to accept this figure with some reservation, more especially as many of the ore blocks on the eastern side of the mine are of very large size. It is naturally most difficult to make a correct estimate of the value of the reef in these large blocks, and fluctuations in grade are also more likely to occur than in the case of small ones. This means that our estimates, however carefully prepared, may require revision from time to time as more work is done and greater knowledge is obtained. I have already indicated that the working costs are not likely to average more than 15s. per ton milled, assuming that the mill will be kept fully at work. You will, therefore, be able to make your own rough calculations as to the profits that may be won monthly or annually from the existing ore reserves, as to the total profit already in sight, and other points of interest to you.

As regards the future beyond the 6,334,500 tons which we now have blocked out, I can only give you rough indications. We have the following data on which to base our estimates of tonnage: The New Modderfontein property consists of 1,301 claims, of which 36 claims are north of the reef and barrier, leaving 1,265 reef bearing claims. Of these 150 were exhausted at the 30th of June, 1914, and have yielded an average of 31,940 mine tons per claim.

Unworked Claims.

There remained consequently unworked on the 1st of July, 1914, 1,115 reef claims. Of these 205 claims are occupied by the present payable reserves, amounting to 6,334,500 tons, while 66 claims are covered by the total accumulation, since the commencement of milling of reef-bearing ground so far not included in the payable reserves. The ore in a portion of these 66 claims will certainly be found to be quite unpayable, and will never be milled. On the other hand, it is expected that a proportion will eventually be found to yield a moderate profit. It will be gathered that there remained 844 claims entirely undeveloped and untouched on the 1st of July of this year. You now have sufficient material for forming your own approximate estimate of the amount of payable main reef ore that these claims contain.

South Reef.

The chances of the south reef, or Modderfontein Reef, can perhaps be left on one side for the present. But they can be borne in mind at a later date. When labour is a little more plentiful it is the intention of the board to test the values of this reef further. It will be remembered that all the earliest development work at our property was done on the Modderfontein Reef. As regards grade, that is the grade of the main reef, we have, besides the value of our large ore reserves, the information afforded by development in neighbouring companies, namely, the Modderfontein B on the east, the Modderfontein Deep Levels on the south, and the Van Ryn Deep on the south-west. Probably never in the history of gold mining has any large property had so solid a basis for high expectations as the New Modderfontein mine has to-day.

Crushing Capacity.

I now turn to our policy as regards crushing capacity. If it had not been for the war we should have already ordered the new plant which is to be erected near the circular shaft with a capacity of 40,000 tons monthly. We have stayed our hands merely on account of the war. It was deemed wiser by the directors here, and by the members of our London committee, to wait and observe events, both in Europe and in South Africa, before adopting a policy that would entail the expenditure of a large sum of money. After, all, we are passing through one of the greatest crisis that the world has ever known. As soon as the position becomes clearer we shall have no hesitation in taking prompt action. All the necessary plans and specifications are prepared so that no undue time will be lost. It may be assumed that it will take about eighteen months to have the plant erected and ready after the orders are placed.

Our estimates as regards capital expenditure still to be faced, as from the 30th June last, were as follows:

Already sanctioned:		
To complete the entire equipment of the cirlar shaft	111,500	
Development in connection with the new plant	21,400	132,900
Not yet sanctioned:		
40,000 ton reduction plant, including refinery, extractor house, etc.	267,700	
Surface equipment, houses, quarters, compounds, etc., in connection with new plant	47,600	
Mine development, including bins, etc. ..	43,700	
Other votes .	10,100	369,100
		£502,000

In addition, there is a further sum of about £42,000, the expenditure of which can be deferred for a long time, and may eventually for the most part not prove necessary at all. Against the above sum of £502,000 we had, as already mentioned, on the 30th of June last in actual cash £210,200 after allowing for the June dividend. There was, therefore, at that date a prospective deficit of, say, £292,000. At the end of next December the position can be made much more favourable if we continue to be conservative in our dividend distributions, and in view of the great war that is now being waged it appears to us desirable to exercise caution a little longer.

Next Dividend.

We have, therefore, in mind the declaration for the next half-year, ending 31st of December, 1914, of a dividend of not more than 15 per cent., or 12s. a share, which we reckon will improve our cash position by approximately £96,000 as compared with the 30th of June last, and leave an estimated shortage of £196,000 in connection with the new plant to be erected. Put in another way, we expect to have at the end of December next £456,200 cash on hand, of which about £8,500 will be the balance of working capital then unspent. After paying a dividend of 12s., or 15 per cent., absorbing £210,000 our cash resources would be reduced to about £246,200. On the other hand, the liabilities to be incurred after that date in connection with the circular shaft and the new plant would amount to about £442,000, apart from the sum of £42,000 which it is not certain that we shall have to spend. There would remain, therefore, about £196,000 to be provided after the 31st of December, 1914, to meet demands on capital account.

Bewaarplaatsen.

I should add that the estimated requirements will be reduced considerably as soon as the company receives the 50 per cent. interest that the Government will recommend to Parliament to cede to the freehold owners of waterrights, bewaarplaatsen, etc. Our interests in such undermining rights would amount to half the sum of £17,310 that we are now paying each year to the Government, and the accumulation falling to us at the end of December, 1914, would total just over £41,000; this has not been taken into consideration in the figures I have put before you. The point I wish to make quite clear is that the amount of cash still to be provided after December in connection with the new plant will in any case not be formidable; it will not be necessary to increase the capital of the company, and it will not be necessary to borrow a single penny in order to provide what is wanted. It will be realised also that there may be no need to restrict dividends much longer. If we continue to make distributions on the same conservative lines as we propose to do for the present half-year, we should, given normal working results, accumulate the whole of the cash still required in a little more than a year, that is before the new works could be completely erected or paid for. This procedure would appear to be drastic unless the war continues, and it, therefore, follows that if all goes well, we may in the near future be able to increase our dividends somewhat, and yet be able to meet out of profits all liabilities in connection with the programme of expansion before this programme can be completed. You can conceive the strength of our position once we have a crushing capacity of over 90,000 tons a month, large ore reserves of good grade, favourable mining conditions, low working costs, and no indebtedness of any kind.

It should also be made quite clear that when the present programme is finished there will be very little further capital expenditure to be incurred during the whole of the life of the mine. Ordinary repairs, replacements and improvements will no doubt be necessary, and these will be charged to working costs in the usual way, but there should be little expense beyond this. A large area of the mine is already developed, and it will be easy to block out the remainder at a very rapid rate; there will be no new vertical shaft to sink. The extreme depth of the reef at the southern boundary of the property is nowhere likely to exceed 2,800 ft. and mining operations will be carried on under conditions that promise to be exceptionally favourable.

Splitting Shares.

Various shareholders have written urging that the shares be split in order to make them less unwieldy for dealing, and easier for the small investor to acquire. Some shareholders have recommended the issue of four new £1 shares for every existing £4 share. One has advocated giving sixteen new shares for every present one. Probably some middle course will eventually be followed. The board will be guided by the wishes of shareholders. The number of shareholders that have so far advocated the scheme is not very great. The board would like to have more support before it takes such a measure in hand.

I wish to add that since the outbreak of the war the gold mining industry has received all possible assistance from the Government, for which we are most grateful. Satisfactory arrangements have been made with the Bank of England as regards the purchase of the Witwatersrand gold production, and cash advances to us against this gold. For the simple solution of this problem our thanks are due to the Imperial Authorities in London, to General Smuts, the Minister for Finance, and to Mr. Leisk, Secretary for Finance in Pretoria. Our industry is one of the very few industries that are not adversely affected by the war. If anything, the production of gold is likely to be stimulated. Everything points to the Witwatersrand gold mines continuing to work in a reasonably normal way, and it is probable that excellent results will be obtained by the New Modderfontein mine and by many others. The supply of native labour, though not sufficient, shows no marked shortage. The stores that we require can under present conditions be obtained without the least difficulty; the cyanide supplies notably, of which a large proportion came from Germany until recently, are being furnished to us by British manufacturers, who are under contract with us until the end of 1915. The fault will not lie with us if British manufacturers do not continue to furnish our requirements of cyanide, and as many other stores as possible, for a long period of years.

I desire to pay a tribute to the exceptional efforts of the staff of the New Modderfontein Mine during the strikes that took place in June-July, 1913, and January, 1914. During the first strike the staff of the New Modderfontein Mine threw itself into the breach when all the hands had left, and with the natives and the men on the reduction works, mining and crushing operations were actively continued. The example set by the New Modderfontein Mine was immediately followed by the Modderfontein B Mine. The work then accomplished by these two companies on the far eastern Rand may serve as an object lesson. The thanks of our shareholders are specially due to Mr. H. Stuart Martin our consulting engineer, to the manager Mr. E. Miles Sharp, to the mine captain Mr. Packhard, the secretary Mr. Edwards, and to the reduction officer Mr. Thurlow, for the work done during these trying periods, apart from the duties carried out by them and by the staff in normal times in the routine of ordinary work. He concluded by moving the adoption of the report of the directors and the accounts.

Mr. S. C. Black.

Mr. S. C. Black said: I have much pleasure in seconding the adoption of the report and statement of accounts. They are so satisfactory from every point of view that litle can be said to supplement what has just been put before us by you with such clarity of detail. Yet there are a few features that stand out in such bold relief from the commonplace of the ordinary annual mining meeting that, if I may be permitted, I should like briefly to lay stress on them to-day. The first one is the increased value of the development tonnage for the past twelve months, as compared with that of the previous year. Despite many difficulties. the management was able to reach a tonnage seldom attained in the history of the company during more placid periods of work. Two million tons of a value of 9.2 dwts., against 8.1 dwts. at which the total development value stood at the end of the financial year of 1913, has resulted in the whole of the reserves —6,334,500 tons—being raised to 8.4 dwts. Granted that the development for 1914 has been confined to the east section of the mine, it is still a happy augury for the future of the company, as the generally accepted theory that reef values lessen in depth on the Rand is rather belied on this property. If we turn to the western section, I have every confidence that when development is taken in hand the values in that part of the mine should approximate on the average to that of the deep level—namely the Van Ryn Deep, whose record is also a surprising one.

Zenith Not Reached.

But the most striking and attractive feature in connection with the position of the company is that it has by no means reached the zenith of production. It could, on the showing of its developed tonnage, and having regard to the virgin area of some 850 reef claims, increase its production of gold by approximately 80 to 100 per cent.; all that is required is the additional plant to which you have referred.

The Witwatersrand undoubtedly holds the world's record for steadiness of gold production since its discovery in 1886. It has given proof of some surprising individual producers, and one cannot therefore but regret the gradual diminution in the output of some of its great outcrop mines. In the case of this company, it should perhaps before very long outstrip in profit-making all rivals on the Witwatersrand.

Wonderful Mine.

I hesitate to indulge in glowing prophecies on the future prosperity of the New Modderfontein, but I cannot conceal from myself that it is a wonderful mine, among a list of remarkable ones. Many shareholders do not yet grasp the potentiality of their own property, but even a cursory examination of the report before us should convince shareholders that they are possessed of a property second to none in gold mining undertakings.

There is just one other feature. It is a salient one and of wider interest. The New Modderfontein is situate in that area of the Witwatersrand to which all eyes turn, and on which all hopes are centred for the future expansion of gold mining in the Transvaal. This company and its outcrop neighbours, by their activity and energy, and owing to the profitable returns afforded to their shareholders for many years past, stimulated the exploitation of the deep level mining now in progress in that Far Eastern section of the Rand. If it should be the good fortune of those deep level mines to achieve, even in a measure, the success of their parent outcrop companies, it is perhaps not imprudent to express the conviction that the high-water mark of gold production on the Rand will not be reached as speedily as some late calculations of technical men have led us to expect.

Mr. Andrew Cohen.

Mr. J. Andrew Cohen said: I should like to associate myself with your remarks and the remarks of Mr. Black in regard to the accounts placed before shareholders to-day. Two or three points in your speech strike me very forcibly, more particularly the warning of caution, where you point out to shareholders as long as they are satisfied to receive half-yearly dividends at the rate of 12s. per share it is more than likely that in just over twelve months from the end of 1914 the whole of the capital expenditure that will be required for the equipment of the new plant will be paid out of revenue. This, I think will be a remarkable record, and without wishing to draw any invidious distinctions I am bound to point out that many industrial corporations in Europe have, through the exigencies of the war, been compelled in some cases to suspend their dividends altogether and in many instances to considerably reduce them. Therefore, shareholders who have their money invested in the New Modderfontein G.M. Co., Ltd., shares must be very satisfied to feel that, notwithstanding the dislocation that is in evidence in pretty well all centres, from the remarks of the chairman it is patent that there is no intention to reduce the Modderfontein dividend during the period of the war. I should further like to take this opportunity of congratulating the Controlling House on having in their employ so able an engineer as Mr. H. Stuart Martin, who some twelve months ago made a report to the directors where he undertook that by June of this year the company's working costs would be reduced to 15s. 6d. That forecast has been met, indeed it has been improved on, inasmuch as the average working costs for the past four months has been 14s. 10d. per ton, which I suggest is a most satisfactory record. So long as this company pursues the cautious policy outlined by you to shareholders they will have every reason to congratulate themselves on being shareholders in one of the premier mines of the Witwatersrand area.

The reports and accounts were adopted unanimously.

Mr. W. H. Dawe was re-elected a director and the auditors were reappointed.

NOURSE MINES.

Annual Meeting.

Encouraging Prospects.

The annual meeting of the shareholders in the Nourse Mines, Ltd., was held on 16th in the board-room, Corner House. There were present Messrs. H. C. Boyd, chairman, Samuel Evans, R. W. Schumacher, S. C. Black, C. Meintjes, F. Raleigh, Henry Nourse, S. M. Nelson, A. G. Gill, E. Renaud, J. Jourdan, B. Moses, F. H. Barry, H. J. McCormick, representing 477,440 shares out of the total issued capital of £827,821.

Chairman's Speech.

The Chairman said: Gentlemen,—The working profit for the twelve months ended the 30th of June last, recorded in the report and accounts now before you was £1[illegible]2,226, or some £62,500 less than the profit for the eleven months covered by the previous report. This decrease is mainly attributable to the extremely unsatisfactory state of the native labour supply, which caused the ore milled monthly to decrease by some 7,500 tons to about 45,000 tons per month, whereas the plant has a capacity of at least 58,000 tons a month. At the last annual meeting I referred to the disastrous effect on our labour supply which the strike in July had had. That strike and the one in January were fully dealt with in the quarterly reports of the period. The disturbed conditions, combined with the withdrawal of natives recruited from tropical areas, resulted in the decrease of our coloured labour force during the first seven months of the financial year by one-third. Since then there has been a gradual improvement, but even at the close of the year we were still some five hundred boys short of the average number employed during the preceding year. The net profit for the year was £160,879, some £18,000 being written off for develoment in addition to the usual charges against the year's working, such as the assessment under the Miners' Phthisis Act. The reason for dealing with the development charge in this manner, and the writing back in the appropriation account of sums previously appropriated for development are fully set forth in the directors' report. The dividends declared amounted to 18¼ per cent. on the capital, and we carried forward a credit balance of £96,569, or £20,399 more than in the previous accounts.

The development footage necessarily suffered, though we continued to do the utmost with the means at our disposal. In the circumstances, the total of nearly 20,000 feet, including over 1,000 feet of shaft shinking, was creditable. The large increase in the ore reserves, raising the ore fully blocked out to not far short of 2,000,000 tons, is due partly to the inclusion of main reef previously regarded as unapayable, which also accounts for the reduction in the average value of the whole of the reserves by a fifth of a pennyweight per ton, and partly to the large tonnage of partially developed ore with which we started the year. You will notice the very material increase in the south reef reserves, the average value of which remained the same, and the small increase in main reef leader, with a slight improvement in value.

The manager's report sets forth in detail the work accomplished underground and the development results obtained Broadly speaking, there was but little change to record in the latter respect compared with the previous year. Development operations were scattered over a wide area and varying results were obtained in the manner which has always been characteristic of our mine. The ground continued to be much broken; the plan attached to the report will give an idea—but only a faint one—of how disturbed the mine is by faults and dykes. Progress was made in the concentration scheme for handling the ore, which can now be brought from either end of the property and hauled through the South Nourse shaft. While working expenditure was naturally increased through the work necessary for the carrying out of this concentration benefits have already been derived from the increased facilities thereby gained for handling ore and from the reduction in the number of hauling engines in use. To this is to be ascribed the fact that the year's working costs showed a fractional decrease per ton: granted an ample labour supply further reduction can be looked for in this direction.

Fluctuating Labour Supply.

During July and August of the current financial year, we gained materially in labour, but since then have again lost considerably. To obtain the best results from the mine, most of our mining should be done by hand drilling. We are very far short of the numbers required for these ideal conditions, and have to accept the fact that we probably always will be; consequently we must continue to use machine drills in many stopes in which they are unsuitable. An overwinding accident in October somewhat affected that month's tonnage, but even so the amount milled monthly during the past four months has increased materially, and costs have in consequence decreased by an average of 1s. 6d. per ton, but the profits have been disappointing owing to the low grade recovered. From the existing ore reserves, allowing for the necessary crushing of development rock, we should recover about 27s. per ton milled. The average recovery during the psat three months has been little more than 25s. Even allowing for the fact that we are still crushing a comparatively high percentage of Main Reef, the mine grade has been unduly low; this point is receiving earnest attention and an improvement is looked for shortly. In a measure the decrease in recovery is due to the fact that it was considered advisable, lest there should be any interruption in the supply, to economise somewhat on the use of zinc in the reduction works. Possibly we have been too sparing in this respect, and we have now returned to ordinary practice and expect the recovery this month to be normal. It is estimated that about £5,000 of gold are in circulation in the plant which would, under ordinary conditions, have been recovered during the past three months. This gold will, of course, be extracted eventually.

The position as regards development shows no very material change; the scale of work has increased, and amounted to over 2,000 feet last month Owing to the unsatisfactory values disclosed round the west incline, stoping has ceased there. Interest naturally centres on the results obtained and to be obtained in the South Nourse section in which a quarter of a million payable tons of main reef, main reef leader and south reef had been developed at the 30th of June. This development, compared with the rest of the reserves, is about 1dwt. per ton lower in value and the percentage of payability to the work done is only a little over 50 per cent. As you will see, however, from the plan, the area developed is extremely limited compared with that yet to be opened, and how best to expedite the development of that ground is receiving the earnest consideration of our technical advisers. The No. 2 shaft is being sunk as speedily as possible, and is to-day down 1,050 feet on the incline. While the importance of exploring this section of the mine with all possible speed is fully recognised, it must be borne in mind that the area yet to be developed above the most southerly transverse dyke shown on the plan is extremely large, and on the basis of past disclosures should be capable of supplying the mills at the present rate of crushing for some twelve or fifteen years.

Normal Conditions.

Thanks to the action of the Union Government and the Bank of England satisfactory arrangements are in operation for dealing with our gold output, and as far as can be seen there should now be no interruption in the supply of essential stores which have to be imported from Oversea. Even in the face of recent deplorable events in this country, we can look forward with confidence to continuing our operations fairly normally. We are, of course, affected to some extent by existing conditions: the price of some stores has risen; a large number of our employes have gone on active service, entailing appreciable disorganisation, and the minds of those who remain cannot but be preoccupied to some extent. But this is a small price to pay for the privilege of being able to carry on our work as we are doing. The needs of the dependents of our men on service are being attended to The members of the board would like to take this opportunity of expressing their sympathy with our Government in the difficult position in which it is placed, and their admiration of the firm steps which it is taking for the restoration of law and order.

Patriotic Funds.

We have contributed £527 to the gift of £30,000 from the majority of the industry to Government for hospital and kindred purposes, and have made small contributions to various patriotic funds. It will be our duty to consider the giving of further sums in this direction, and the board is satisfied that shareholders will approve of their doing so. It is with great regret that we have to record the death of Mr. C. Rube, who had been for many years a member of the London committee of this company. Before closing, I would testify to our appreciation of the valuable services rendered by the consulting engineer, manager and staff generally during the exceptionally trying period since we last met. I now beg to move the adoption of the reports and accounts for the year ended 30th June, 1914.

Mr Gill seconded and the motion was carried

Messrs. H. Nourse and R. W. Schumacher, the retiring directors, were re-elected, and the appointment of Mr. E A. Wallers to the board was confirmed.

ZAAIPLAATS.

A Satisfactory Showing.

The Market Position.

The annual meeting of the Zaaiplaats Tin Mining Co., Ltd., was held at the Head Office, Pretoria, this week, there being present Sir T. K. Murray, chairman, D. M. Munro, J. Macintosh, C. P. Marais, J. Yendall; R. Kerr, F. K. Murray, J. H. E. Wagner, S. A. Klagsterie, D. S. Ross, J. Munro, W. W. Louttit, and H. P. Webber secretary.

Chairman's Speech.

In the course of his speech, in moving the adoption of the reports and accounts, the Chairman said the total working expenditure during the year amounted to £63,796, or 26s. 0.8d. per ton treated. Comparing these figures with the expenditure for the previous year we find that there is an increase of £1,773 in the total expenditure, while the cost per ton treated has been reduced by 5s. 6d. per ton. This reduction in costs I think you will all agree, must be considered as eminently satisfactory. Turning to the revenue side the net revenue from concentrates won amounts to £124,155. This figure is about £18,000 less than the revenue earned for the previous year in spite of the fact that we produced 158 tons more concentrates. This reduced revenue is, of course, entirely due to the fall in the price of the metal. As you will have seen from the directors' report the average price realised for the year was £44 per metallic ton lower than for the previous year.

Marketing Produce.

The position in regard to the marketing of our product has been frequently explained, not only by this company, but through the other tin mining companies in the Transvaal, so I do not propose to explain today how the company's output is dealt with. I would, however, just remind you that the realisation of tin is essentially a speculative business and, in selling our outputs, we are very much in the hands of large speculative corporations and are, therefore, practically forced to accept the ruling prices at the time our concentrates are ready for sale. As regards the future of the tin market, it is vetry difficult for us to obtain statistical returns as to the supply and demand, but it would appear that at present there must be an enormous wastage of material in the manufacture of which tin is used and the making up of this wastage as well as the meeting of current requirements, should ultimately create a big demand for this metal with consequent increase in price. Owing to the closing of the London Metal Exchange which took place simultaneously with the closing of the Stock Exchange on the outbreak of hostilities, the Straits Trading Company advised us that they were unable to continue business with us on existing terms. At the close of our year there were 42 tons of concentrates on hand which were not sold owing to the unsettled condition of the tin market, but these 42 tons have since been shipped to England for realisation. The price obtained for this consignment is £139 per ton of metal, which, I may say, is a little higher than the price estimated in the accounts for the year.

War Policy.

In view of the disorganisation of trade, caused through the outbreak of hostilities in Europe, your directors met and thoroughly discussed the policy which should be adopted by the company. At the time of this discussion we had before us very strong recommendations from our mine manager that sooner or later milling operations would have to be temporarily suspended for the purpose of renewing portion of the battery foundations and timber framing, and repairing the crusher plant and other minor sections of the plant. We, therefore, gentlemen, had no hesitation in deciding that the present was a most opportune time during which to carry out these renovations and repairs. Instructions were, therefore, given to the manager to suspend all crushing and treatment operations and to take in hand at once the renovating of the battery foundations and the other work referred to above. At the same time the manager was instructed to proceed with as much underground work as could be economically accomplished and also to keep the new slimes plant running as far as possible. The work referred to was completed about the middle of October, and from that date milling operations have been resumed.

During the period of cessation of milling operations the net expenditure has been as follows: August, £2,576 11s. 1d.; September, £1,907 8s. 11d.; and October, £2,530 13s. 4d.; or a total of £7,014 13s. 4d. During August and September 18 tons of concentrates of an average grade of 68.5 per cent metallic tin have been accumulated by means of the slimes plant, while in October 20 tons were produced. We have now accumulated a quantity of 50 tons, of which 40 tons are on the way to England for disposal. The balance will be shipped at an early date. So long as we can dispose of our outputs by shipping to England there need be no fear whatever but that operations will be carried on on more or less normal lines. Up to the present we have not been able to resume operations on normal lines for two reasons. Native labour is very scarce owing to the ploughing season and at the present we have only able to get together half our complement of boys; while we have been further hampered by the fact that several of our white employes have been commandeered for active service, and others have been called out to serve in the various corps to which they belong. With the remaining men and the small native labour force we are, however, able to keep ten stamps running almost continually. To assist the company in continuing operations during these troublesome times the manager and the whole of the company's staff voluntarily offered to accept only half-pay on the understanding that the balance would be credited to them and paid out when we are able to resume the realisation of the production under normal conditions. Your directors have also agreed to postpone payment of the fees accrued to them for the year, and I am sure we all feel very grateful for the assistance which has in this way relieved the strain of drainage on the company's cash resources.

Income Tax.

Before leaving the financial side of the company I wish to draw your attention to two or three other important items. You will observe from the balance sheet that the company has created a reserve fund in accordance with the policy advocated at the last annual general meeting and that an amount of £7,000 has been appropriated for this purpose. The object of this reserve fund is, in addition to strengthening the financial position of your company, to meet any unforeseen contingencies. You will also observe that a note has been placed on the balance sheet to the effect that no liability in respect of income tax has been shown in the accounts for the year as the company was then obtaining the opinion of counsel as to whether the company is liable or not for this tax. This opinion has now been received and, without going into details, states that legally the company cannot avoid payment of the tax. Counsel, however, at the same time points out that it is inequitable that the holders of mineral leases from the Government after the 1st of January, 1909, should be in a better position than the holders of leases entered into before that date. In other words, companies who obtained leases from the Government after that Act was brought into force are exempt from the payment of income tax, while your company, merely because its lease was granted prior to that date, is liable for this tax. In counsel's opinion there has been a "casus omissus" in framing the Gold Law and consequently your directors have made representations to the Minister of Finance on the question. We have not yet received a reply to our appeal. I would, therefore, ask shareholders to bear in mind that in addition to the liabilities shown on the balance sheet there will probably be a further amount to meet of something like £3,500 to £4,000. The year has been a fairly lucrative one as regards dividends and we were able to pay £15,000 more to shareholders than during the previous year. The total amount paid for the year was £42,000 equiavlent to 70 per cent. on the capital. Since the inception of the company, only six years ago, an amount of £318,000 or 530 per cent. on the capital has been distributed in the form of dividends, which I am sure is a very satisfactory showing.

The accounts were adopted; Mr. John E. Orr was elected director in the place of Mr. W. St. John Kearney (resigned); and Mr W. J. Gau was re-elected director. Mr. John Dougall was reappointed auditor for the ensuing year.

Elandsfontein Estate Company

LIMITED.

(INCORPORATED IN THE TRANSVAAL.)

INTERIM DIVIDEND No. 53.

NOTICE is hereby given that an Interim Dividend (No. 53) at the rate of 5 per cent. (One Shilling per share) has been declared by the Board of Directors, payable on 1st December, 1914, to all Shareholders registered in the Books of the Company on the 25th November, 1914.

The Transfer Books of the Company will be closed from 25th to 28th November, 1914, both days inclusive.

Dividend Warrants will be posted to Shareholders on the 1st December, 1914.

By Order of the Board,

THE CONSOLIDATED GOLD FIELDS OF SOUTH AFRICA, LIMITED, Secretaries.
per A. C. GRANT

Head Office :
Consolidated Gold Fields Buildings,
Simmonds Street, Johannesburg,
14th November, 1914.

The National Bank of South Africa,

LIMITED.

INTERIM DIVIDEND.

NOTICE is hereby given that an Interim Dividend at the rate of Six per cent. per annum has been declared for the half year ended 30th September, 1914, being Six Shillings per share.

The Dividend will be payable on 7th December, to all Shareholders registered in the Books of the Company at close of business on 30th November, and to holders of Coupon 32 attached to Share Warrants to Bearer.

The Transfer Books of the Company will be closed from 1st to 5th December, both days inclusive.

Dividend Warrants will be sent in due course to Registered Shareholders by the London Office.

Holders of Share Warrants to Bearer are informed that Coupons may be deposited at any of the Bank's Branches, and will, upon verification by Head Office, be paid on or after 7th December, next.

By Order of the Board of Directors,
C. P. MATHEWS,
Secretary.

Pretoria, 11th November, 1914.

CASH BUYERS OF ALL MINERALS AND ORES, PARTICULARLY
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THE SOUTH AFRICAN

Mining Journal,

WITH WHICH IS INCORPORATED

South African Mines, Commerce and Industries.

ESTABLISHED 1891.

VOL. XXIV., PART I.] NOVEMBER 28, 1914. [No. 1209.

HEAD OFFICE: 176-180, Stock Exchange Buildings, Fox Street (2nd Floor), Johannesburg, Union of South Africa.

Telephone **913.** P.O. Boxes **963** and **418.**

Cable and Telegraphic Address: **"MINING JOURNAL."**

AGENTS FOR GREAT BRITAIN: Argus Printing and Publishing Co., Ltd., Byron House, 82-85, Fleet Street, London, E.C.

AMERICA: Advertisements accepted from any recognised Advertisement Agency.

ANNUAL SUBSCRIPTION RATES: Oversea, £2; South Africa (by post), £1 10s.; Local Delivery (Town only), £1 6s.

Copies of this journal are obtainable at all Branches and Agencies of the Central News Agency, Ltd., at all News Agents and Railway Bookstalls throughout South Africa, and at the London Agency as above.

NOTICE.—The postage of this issue of the *S.A. Mining Journal* is: South Africa, 1d. All other parts, 1½d.

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Notes and News.

Modder Deep Mill Starting.

At the Modder Deep Levels work is progressing satisfactorily. Underground, stoping is in active progress, and large dumps of ore are being accumulated on the surface. The finishing touches are now being put to the reduction plant and the stamps should begin to drop about the middle of next month, or in about a fortnight's time. Following the example of the Government Areas, the first output to be declared will be for the month of January. An ample supply of native labour is forthcoming, and the prospects of the mine may generally be described as excellent.

* * * *

More Government Mines.

Several letters have reached us dealing with the subject of more Government mines in the Far East Rand area. The burden of these is that it would be unfair to the State and the taxpayer to throw these open to tender now, in view of so much capital being locked up on account of the war. It is contended that normal conditions in this respect will hardly be restored for two years after the cessation of hostilities, and that the best bargain for the State cannot therefore be struck until that period has elapsed. The view is an interesting one, and we find it is shared by many. We never suggested, of course, that Government should take any active step in the matter at this time; and our proposal merely amounted to a reminder to those who feared that the cost of present troubles could only be met by a big increase in direct taxation. We hope to return to the subject at an early date.

* * * *

Messina (Transvaal) Development.

Shareholders in the Messina will be consoled by the remarks of Mr. H. C. Hoover at the Camp Bird meeting. Messina, he remarked, is a valuable copper mine, and in ordinary times, at an average price of copper, should earn profits of about £10,000 per month. The present ore reserves ensure between three and four years' supply for the treatment works. Developments at the 10th level are encouraging for further extensions in depth, and other reefs are owned from which something may be hoped. Steady profits are being earned, and if copper does not dip below the current price the company should be able gradually to strengthen its finances.

* * * *

Herr Dernburg on the Importance of the Rand.

The English papers to hand by last mail—notably the *Contemporary* and the *Journal* of the African Society—deal at considerable length with the German conspiracy to undermine South African loyalty and to win for the Fatherland in South Africa a larger place in the sun and under the Southern Cross. That possession of the Rand by Germany was also part of the plan goes without saying, and in this connection the notable tribute to the world-importance of the industry paid by Herr Dernburg, then Imperial Colonial Secretary, during his visit here in 1908 may be recalled. He flattered the Rand by attributing to it most of the credit for maintaining the gold standard.

> "The Rand," said His Excellency, "had succeeded in fixing the monetary standard of the world's commerce. Not many years ago they would remember that there was very grave doubt which standard the world would adopt, and it was the gold which had been discovered here that settled the question so far as the whole of the civilised world was concerned. That standard was decided, he thought for ever, by the gold which Johannesburg produced. The countries had been convinced of the soundness of the gold standard, and the gold system was now an accomplished fact in all the civilised countries of the world."

Metal Exchange.

Another step towards establishing business on the London Metal Exchange on normal lines was taken in mail week, when the Committee, as had been officially foreshadowed, fixed Settlement prices to operate on 5th November as follows:—Copper, £50 10s. per ton; tin, £132 per ton; iron, 49s. per ton. "All differences which came into the clearing on 7th August are subject to interest from that date only." The previous Settlement prices ruling when the Exchange closed at the end of July were as follows:—Copper, £56 10s. per ton; tin, £133 per ton; and Cleveland iron, 51s. per ton. It will be remembered that even after the Metal Exchange was re-opened at the end of August dealings in the Room below the end-July prices were not permitted until 20 November. Members may, however, now deal privately between each other in the Room, as well as outside, at any price, the only restriction being that they must not form an open market in a "ring" in the Room.

* * * *

Anglo-French Matabeleland.

As revealed in its annual report, the general financial status of the Anglo-French Matabeleland Company, Ltd., at the close of its last financial year exhibits little variation from the position disclosed a year ago. The available cash, together with the amount on loan less sundry creditors, totalled at May 31 last approximately £26,500. The profit and loss account for the period under review shows a credit balance of £1,787, which, with the sum brought in a year ago, makes £5,831, and this the directors propose to carry forward. The company's total gold claim holding now stands at 190, ten claims having been abandoned as unpayable. Farms are held in the districts of Belingwe, Gwelo, Shangani, and North Umtali of an area of approximately 329,508 acres. Increasing attention is being devoted to ranching, and an independent valuation of the cattle made on May 31 showed an excess of over 25 per cent. as compared with the cost price given in the accounts.

* * * *

The Rains and Mine Dams.

The excellent rains of the past week have replenished the mine dams. The secretary of the Nigel advises us that "rain has fallen at Nigel; the water stored is sufficient for three months." Other "outside" mines have received equally welcome relief, and the outlook for water is now distinctly satisfactory. The agricultural industry likewise has greatly benefited from the copious rains.

* * * *

Advice on Rand Trade.

A correspondent of a London paper gives the following advice in regard to the capture of Rand trade that hitherto went to Germany:—"British firms," he says, "must use every endeavour to meet the new conditions, and place merchants in this country in a position to supply the large demands at competitive prices. This can be largely accomplished by giving them facilities for carrying larger stocks of up-to-date materials, and standing loyally by such firms as they appoint their agents, and not making competitors in their own specialities amongst rival firms. Agencies to be a success must be *sole* agencies in every sense of the word. The writer knows of local firms who have spent considerable time and money in introducing specialities, and then found out afterwards that several opposition firms have secured the same goods, and are quoting in the market against them. Principals should give their agents every facility for arriving at quotations, furnishing full particulars, drawings, and weights of their respective goods on the spot, and not have to be continually referring by letter or cable for fuller information and prices. The trade in South Africa is growing by leaps and bounds, and in order to keep our goods on the market, British firms must give more attention to the matters mentioned above. The writer suggests that firms of standing here should be approached direct or through their London export merchants, and invitations made for them to represent their manufactures as sole agents, and in the event of satisfactory arrangements being concluded, the question of consignment stocks or full confidential information could then be finally settled. In conclusion, the writer trusts that British manufacturers in electrical and kindred trades will take this matter up seriously, and grasp the opportunities now arising to recover lost ground, and build up a strong British electrical trade with the Union of South Africa and with Rhodesia."

* * * *

Rand Dividends and Share Prices.

"The field never was cheaper than it is to-day" is how one well-known speculator, who has managed to retain his optimism in face of all discouragements, sums up the position. The dividends to be declared in the next fortnight or so promise to be quite normal; and the profits being earned would permit of even increased declarations being made in some cases. Among coal mines, both the Witbank and Kroonstad companies, which declared dividends in September, were able to make higher distributions. Among the gold mining companies, the Ferreira Deep in September declared a dividend at the usual rate of 25 per cent., absorbing £245,000, the Transvaal Gold Mining Estates announced a distribution of 17½ per cent., the same as for the previous half-year, while the Wolhuter declared 6¼ per cent., comparing with only 3¾ per cent. for the corresponding period a year ago. That the Rhodesian mining industry is unaffected is evident from the resumption of dividends by Crescens (Matabele) Mines, which is distributing 5 per cent., the first dividend since the one made at a similar rate in respect of 1910-11. Both the Kimberley Water Works and South African Lighting undertakings are maintaining the same rate of distribution as made for the corresponding period.

* * * *

Clydesdale (Transvaal) Collieries.

The report of the Clydesdale (Transvaal) Collieries, Ltd., for the year ended 30th June, 1914, shows a balance of cash assets in excess of cash liabilities of £28,834. The gross profit of the two working collieries was £19,853, while revenue from other sources amounted to £2,680. The amount carried to appropriation account is £16,953, giving a total at credit of that account of £48,285. Of this £6,526 has been allocated as depreciation of plant and buildings at Coalbrook and Springs properties, £625 to provide for interest and charges on debentures and £9,250 for a dividend of 5 per cent., leaving a balance to be carried forward of £31,884.

* * * *

"Astonishing Figures" of our Trade and Industry.

The latest report of Sir R. Sothern Holland, His Majesty's Trade Commissioner for South Africa, is now just available in the form of a small Blue Book for the year 1913. Sir R. Sothern Holland presents figures in proof of what he calls "the overwhelming preponderance of the gold mining industry in the economics of South Africa." He points out that this central industrial area of the Transvaal contains a population of well over half-a-million and is responsible for a large proportion of the country's internal trade. Proof of the country's capacity for absorbing much larger quantities of manufactured goods from Great Britain is seen in the fact mentioned by Sir R. Sothern Holland that for the year 1913 there was a trade balance (excess of exports over imports) of £28,712,692, while during the past six years the excess of exports over imports has amounted to £143,485,676. "Out of this sum the country is well able to meet its obligations in respect of borrowed capital and other charges, which include public debt, municipal borrowings, mining and industrial undertakings, financial corporations of all kinds, the purchase of Government stores, the excess of imports over exports in respect of specie, freight charges, etc." Comparing the values of imports for 1913 with those of 1908, it is found that every class of trade shows a marked development. Foodstuffs increased by £1,659,369, material for agriculture and farming by £1,228,914, mining material by £192,831, electrical material by £565,265, miscellaneous machinery, etc., by £897,787, building and constructional material by £1,139,045, requirements for other local industries by £2,034,464, clothing and wearing apparel by

£1,869,520, textiles by £1,246,973, furniture and household requirements by £552,038, goods indicating surplus spending power by £2,158,902, educational and office supplies by £250,574, drugs, chemicals, etc., by £258,120, and miscellaneous goods (unclassified) by £719,402; in other words, the total value of imports of general merchandise entering the Union from overseas increased by an amount of £14,713,234 during a period of five years, in addition to which the imports of Government stores increased by £2,515,547—making a total increase of imports of overseas merchandise of £17,228,781. "These," as the Trade Commissioner says, "are astonishing figures." Sir R. Sothern Holland adds that "a close examination of the trade returns for successive years reveals the fact that this great expansion of trade synchronises exactly with the consummation of the political union of the four Colonies, a fact which suggests that the notable change in the constitutional arrangements of the country and the consolidation of its financial and economic interests inspired the community and the overseas investing public with greater confidence, which awakened a new spirit of enterprise and industrial development in South Africa." Further, he says: "I think that the country as a whole has made up its mind to 'speed up' in the development of its agricultural and pastoral industries, and so, in the course of time, to become less dependent than it is at present upon the mining industry as the chief wealth-producing factor in the country."

* * * *

Chemicals from Germany.

At the October meeting of the Chemical, Metallurgical and Mining Society Mr. John Watson called attention to the fact that the President of the Board of Trade has appointed an influential and representative Committee to consider and advise as to the best means for obtaining, for the use of British industry, sufficient supplies of chemicals, etc., hitherto produced by Germany and Austro-Hungary. The last number of the Journal of the Society of Chemical Industry calls our attention to this Committee, of which Viscount Haldane is Chairman, and Mr. F. Gossling, Secretary. The latter's address is:—Commercial Intelligence Branch, Board of Trade. Mr. Watson added:—"Certain articles have been going up very much in price out here. Of course, the question of cyanide has been dealt with by the Chamber of Mines, which is satisfied that we can get plenty of cyanide to supply all the requirements of this gold industry. I will mention three or four other things:—Mercury, some time ago, could be bought for something like £7 10s. per bottle, but recently the price went up as high as £22 10s. Apparently, a "ring" was attempted. Mercury was obtained from Idria, in Austria; but it also occurs in Almaden, Spain, in New Almaden, California, and in China. Porcelain basins and crucibles are largely used in assay offices. I understand that when the present stock on hand is used up it is doubtful where further supplies are to come from. I gave the Derby Porcelain Co. a hint regarding this matter last July, when visiting their works. Salicylic acid is a household medicine, as soda salicylate, or "Aspirin," for rheumatism, etc. Sodium salicylate has gone up in price from about 1s. 6d. per bottle, wholesale rate, to 10s. in the last few months. Potassium permanganate and pyrogallic acid are also reagents which have considerably increased in price. In addition to the Committee mentioned above, the Society of Chemical Industry and the London Chamber of Commerce have also each appointed a Committee, and they are now seriously doing their best to help to establish the manufacture of such products in Britain and her Colonies. I am calling attention to this matter because, I think, buyers on the mines throughout South Africa should know to whom to apply in case they are being hampered by high prices. The Committee has got to work, and published lists of—(a) Articles which inquirers wish to buy, and (b) articles which inquirers desire to sell. (See Journal Society Chemical Industry, 15th Sept., 1914.) They are filing catalogues and have a large sample room for goods, which have hitherto been made in the countries with which we are now at war, but which it is hoped, ere long, to obtain from Great Britain, her Dominions, or friendly countries."

TOPICS OF THE WEEK.

SOUTH AFRICAN COAL MINING INDUSTRY AND THE WAR.

The extent to which the South African coal mining industry is affected by the present crisis is, of course, of vital importance to the country, and we have been at some pains to gather together the facts of the position. The exigencies of the military situation have, of course, temporarily affected the transport of coal to south and south-western ports—notably Table Bay—in the past three weeks; but the reserves accumulated there, with wise prevision, in the first three months of the war have proved ample to satisfy all the demands made upon them. At Delagoa Bay the situation is likewise satisfactory. It is true that the falling off in the number of merchant vessels calling has reduced the demand for bunker coal. But the export trade through the port otherwise remains normal, and the smooth working of the new modern coal-loading plant is an encouraging feature of the situation. Again, what may be described as the internal demand which, of course, includes the coal supply to Rand mines and central power stations is, as might be expected, normal. It is true that it may not be possible in all cases to meet the exact requirements peculiar to the big power stations. The production of slack and fines bears, of course, a fixed ratio to the quantity of coal mined, and the amount of the former available must, therefore, decrease with the latter. But the net result is not unsatisfactory, and, in the circumstances doubtless a spirit of mutual "give and take" prevails between suppliers and consumers. The curtailment of shipping at all the ports has, of course, militated against the coal export trade, and the possibility of capturing an increasing share of the South American market, which at the beginning of the war, it may be remembered, seemed feasible, is naturally for the same reason delayed. With the command of the sea assured to us, this delay in the fruition of the hopes of the South African coal industry is, of course, merely temporary. To mark their appreciation of the magnificent work done by the Imperial Navy and by the Union Government forces the associated collieries of the Transvaal have offered the Admiralty 15,000 tons of coal and the Union Government 10,000 tons—and, of course, there is always more whence these came from. It only remains to pay tribute to the part played by the railways in seconding the efforts of the coal industry to meet the unprecedented demands of to-day. The ordinary layman can have but a faint idea of the tact and energy demanded of those responsible for the railway transport of the enormous masses of troops suddenly mobilized throughout South Africa in the past few weeks. The coal industry, which has never been slow to voice its dissatisfaction with the S.A.R. Administration, when it had cause to do so, now unstintedly bears testimony to the heroic efforts successfully made by the Administration to satisfy the unique needs of the moment. Mr. S. C. Black, speaking of the position of the Transvaal and Delagoa Bay Collieries this week, gave expression to this view. "Despite the outbreak of the European war at the beginning of August," he said, "production has proceeded with little interruption, till about the end of October last. Since that date the regrettable events in our midst have caused difficulty in running on certain of the main lines of railway through the O.F.S. It reacts on the smooth working of the collieries, through a shortage of railway trucks, and temporarily interrupts the regularity of output. We expect a restoration to normal conditions before very long, inasmuch as the vigorous measures adopted by the Union Government to suppress disorder in the disaffected parts within the Union can have but one issue; I am firmly convinced that it will be a speedy and successful one." As a fact, the railway people of all ranks from the General Manager downwards are, like our gold and coal miners, manfully doing a brave share in fighting the common enemy. And when the pressure of present events is relieved, both coal mines and railways will doubtless spring back to a position which will be normal and something more than normal, when industry will not be as usual but better than usual.

WHAT'S WRONG WITH RAND SCIENTFIC AND TECHNICAL SOCIETIES?

THE sparse and disappointing attendance at recent meetings of Rand scientific and technical societies cannot be wholly attributable to the war. It is true that a great many men from the mines, including many members of the societies, are on active service, and that the leisure of those who remain is mainly devoted to drilling and special police work. These excellent activities, however, can hardly be said to explain the evident reluctance of so many members of our leading societies to spare even the two or three hours a month, which is the maximum demand they make on one's time. The reason, we believe, in the case of the larger societies lies deeper. The Geological Society, of course, never boasted a big roll of membership, and its attendances have always been composed of the select and learned few. The Institution of Electrical Engineers is a comparatively young body, and, for its years, has less to complain of, in point of its monthly musters, than any of its sister societies. The two senior societies, the Institution of Engineers and the Chemical, Metallurgical and Mining Society of South Africa, appear to be the worst sufferers in this respect. At a recent meeting of the former we noticed that very few were present outside the members of the Committee, and those members who had come expressly to read papers or contributions. Even of those who contributed to the discussions, two could not attend in person, and to the secretary was left the none-too-easy task of deciphering their lucubrations. To crown all a distinguished member and prominent mine manager who had come prepared to open an impromptu discussion on a mining subject, presumably of topical interest, was constrained to announce that he thought it better to postpone the debate until he saw some of his mining confreres present. And this was the third successive occasion, it appears, on which the matter had to be shelved! The Chemical, Metallurgical and Mining Society also suffers—though perhaps not in the same way. Indeed, at a recent meeting of this society—which was primarily devoted to mining—an impromptu debate on the evergreen subject of sorting bid fair to last into the small hours, and was only brought to an end by the intervention of a particularly able acting chairman. While the fact speaks volumes for the eloquence and readiness in debate of the mining section of the audience, it is clear that the effect on those members who were interested mainly in chemistry and metallurgy was certain to be mixed. As a fact, we often find once prominent members of this society giving as a reason for their absence from the monthly meetings the all-too-comprehensive nature and scope of the programme and proceedings. We have the greatest admiration for the invaluable work done by the C.M. & M. Society in the past twelve years on the Rand, and it is with the utmost reluctance, therefore, that we ventilate the complaints that have reached us on the score of its too ambitious scope. A case in point is the recent paper on "Gold and Prices," read before the Society by Prof. Lehfeldt. This paper and the discussion it provoked were concerned entirely with the so-called "dismal science" of economics. Metallurgists who are members of the Society and specialists in their own sphere, complain that lengthy discussions on economics cannot possibly be expected to interest them. Indeed, they even regard themselves as having a grievance in that they were led to expect from the mention of gold in its title to hear a paper that would be of interest or value to them in their work. Similar instances, we believe, might be multiplied, and it is plain that, taken altogether, they do much to lessen the attendances at meetings. We admit it is far easier to diagnose the *malaise* than to indicate a cure. Naturally all the societies seek to be big and flourishing and to extend the field of their usefulness as widely as possible. The point at which that field becomes too wide for proper, intensive cultivation is obviously a nice one to decide. That there are some within the ranks of the societies who believe the point has been overstepped, we have tried here to indicate. Since the officers of these bodies, who are, after all, the people chiefly concerned may—as usually happens—be the last to hear those complaints, we take the opportunity to bring them to their notice. We trust they will acquit us of any intention other than that of increasing the usefulness of their societies.

THE FUTURE OF RAND UNDERGROUND CONDITIONS.

READERS will doubtless have perused with interest and profit the contributions that recently appeared in our columns on mine ventilation, from the pens of Mr. H. Stuart Martin and Mr. James Whitehouse. As apologists for the present position in this respect on the Rand, both of those authors, of course, are open to the objection that they occupy prominent executive positions in the industry, and are naturally defenders of things as they are. While admitting the force of this contention, it seems to us that the two papers in question are to be welcomed as revealing the continued desire for improving conditions underground that actuates our leading engineers. We are not of those who believe that all is run on the best possible lines underground on the best of all possible Rands. The preachers of discontent may temporarily be hushed in the grim presence of war, but no one must conclude from this that all cause for complaint has been removed from the mines of the Rand. When the big issues of war are decided we must expect to hear again of dust and bad ventilation, though fortunately in an ever-narrowing area. In the troubles of last year we were constantly being assured by our friends from underground that it was not "the money" they had to complain of, but the conditions and their sometimes harsh treatment by the mine manager. It will be a good thing for the Rand and all of us if now in this period of trial and flux and levelling up, our mine managers endeavour to remove the last vestige of cause for complaint or even the very appearance of such cause. If, despite all the reassuring things we have been told by the Government Mining Engineer in his last report, there still be a mine on the Rand where no adequate attempt is being made to combat the twin evils of dust and bad air, now is the time to attend to it, so that the preachers of discord will be confounded on the inevitable day of their resurrection. And if there be any ground for these murmurings of harsh treatment—we, of course, do not say there is—let the matter be set right once and for all. To-day the industry is rendering a great and signal service to the credit of the Empire, and every helper, in whatever capacity, can take justifiable pride in the fact. And this encourages us to hope that the blending and mollifying influence of the time may continue permanently to pervade the relations of managers and men, long after the last trump of the war is heard in the land. For our mine managers the opportunity is indeed unique to make it impossible for dissatisfaction ever again to grow great enough to find active expression on these fields.

The Imperial Institute and Trade.

The number of inquiries received by the Imperial Institute from manufacturers, merchants, and others in Great Britain and the Colonies, relating principally to sources of supply of raw materials, methods of utilising new products from the Colonies and India, or to new or little known processes and machinery for industrial purposes, has now become so great that the Secretary of State for the Colonies has authorised the formation of a Technical Information Bureau at the Institute for dealing with them. The present is a specially opportune moment for the formation of such a Bureau, since the paralysis of German and Austrian trade and industry opens up opportunities for the development of many industries in the United Kingdom and in the Colonies which have hitherto been monopolised by Germany. A very important question at the present moment is that of the supply of potash salts, which are essential in certain branches of glass and soap manufacture, and for the preparation of a large number of chemicals and manures. Germany has for many years had a practical monopoly of this industry, owing to her possession of the great potash mines of Stassfurt. The only country which has made any attempt to break this monopoly is the United States. The possible sources of supply of potash to England just now are few, and the Bureau is preparing a statement as to sources of potash, which will include some hitherto untouched for industrial purposes. An equally important matter is that of finding markets for the immense quantities of raw materials from India and the Colonies formerly exported to Germany.

MARICO ZINC MINES CONCENTRATION PLANT.

Description of First Equipment of Its Kind in South Africa—"Last Word" in Modern Practice—Blane-Witkop Mines About to Start Production.

THE modern concentration plant that has been installed at the Blane-Witkop mine in the Marico district has now been practically completed, and it is expected that production will begin about the 10th proximo at latest. The "T.C.L.," it will be remembered, are interested in this important property, and the consulting engineer of that company, Mr. J. Jervis Garrard, is responsible for the flowsheet of the plant. The general manager of the mine is Mr. J. W. Blane, and Mr. J. W. McKim is the reduction officer. The plant is quite the "last word" in modern zinc ore concentration practice, and the following brief description—the first that has appeared in print—will be found of interest:—The ore is delivered by coco pans from the mine by sorting belt into a 15 × 9 Blake crusher, and from crusher it is delivered to a storage bin having a capacity of 60 tons. From storage bin it is discharged over a shaking screen into 30 × 14 rolls, and any material under ½ in. passes through shaking screen, and is delivered direct to 56 ft. elevator, and the coarse rock, after passing through rolls is also delivered to this elevator. This material is elevated to a 36 in. × 8 ft. trommel, the first 4 ft. of which is clothed with 3-16 in. perforated screen, and the last half with ½ in. perforated screen. The ½ in. material from screen is delivered to the coarse jig, and the 3-16 in. material is delivered to a one-compartment Richards Hindered Settling Classifier, the underflow from which goes to a medium jig, and the overflow to a 36 × 6 ft. trommel with 1-16 in. perforations. The oversize from the first trommel is returned to the 30 × 14 rolls for re-grinding. Material passing through the 36 × 6 ft. trommel perforations is delivered to a 4-compartment Richards Hindered Settling Classifier, and the oversize is delivered to 24 × 14 rolls for re-grinding. These rolls also re-grind the middlings from medium and fine jigs. The first compartment of the 4-compartment Richards Classifier delivers to fines jig, the second compartment to No. 1 Wilfley table, the third compartment to No. 2 Wilfley table, and the fourth compartment to No. 1 Isbell Vanner. The overflow from this classifier is delivered to a Callow thickening tank, and the discharge from this tank is treated on No. 2 Isbell Vanner; the overflow from tank going to slimes dam. The middlings of Wilfley tables are delivered to the 24 × 14 rolls for re-grinding, and the heads of the Isbell Vanners are re-treated on a 12 ft. buddle. The concentrates will be principally made in the jigs, and discharged direct from jigs into concentrate bins. The only concentrates which have to be handled by hand are those made on the buddle, but the quantity of these concentrates will be small. The tailings from all machines, except the vanners and buddle, are discharged on to a de-watering platform, and the water drained off into a sump, and from same it is pumped by return-water pump to mill storage tank. The water carried out with the slimes will be returned by means of a motor-driven triplex pump located at slimes dam, as the district in which mine is located is a dry one, and every care has been taken in the design of plant to conserve water. All material re-ground by the 24 × 14 rolls is elevated to the 36 × 6 ft. screen, so as to get it back into the circuit, and as all the material is re-ground before being elevated, it results in the liberation of gangue from the mineral. All of the machinery included in the plant was supplied by the Allis-Chalmers Manufacturing Company, of Milwaukee, through the firm of Mr. Herbert Ainsworth, and in addition to supplying the plant, the firm contracted for the erection of buildings and machinery, and the turning over of the plant to the company complete and in running order.

German Economics.

Herr Havenstein, the Chairman of the German Imperial Bank, has issued a statement to the effect that the German Money Market has proved itself firmer than that of any other country, and that Germany is the only manufacturing country that has not found a moratorium necessary; also that the banks are giving practically unlimited credit. This is curious, seeing that Germany is now practically under a system of forced paper currency and forced loans, while the notes of the Reichsbank are said to be depreciated to the extent of 35 per cent. A still more astonishing statement made by the worthy Herr is that the decrease in German exports during August was not so great as that in the British exports. A state of war prevailed during nearly the whole of August, and German overseas commerce, except such small shipments as may have filtered through in neutral bottoms, was absolutely blocked. Where, then, did the exports go? We should very much like to see Herr Havenstein's figures.

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The Institute of Industry.

An influential gathering of representatives of British and Colonial industries met at the Savoy Hotel, London, on October 8th, for the purpose of inaugurating discussion of the proposed Institute of Industry and Commerce, which is being established for the encouragement and promotion of British industry and commerce. Mr. J. Taylor Peddie presided at the luncheon, and those present included Lord Aberconway, Mr. G. Mure Sitchie, Col. J. S. Wright, Sir E. H. Holden, Sir J. Heath, Sir R. Hadfield, Mr. E. Parkes, M.P., and Mr. C. J. Fairfax Scott. The chairman explained the principles upon which the institute is being formed, and emphasised the supreme necessity of organisation among the manufacturers and merchants in Great Britain, for the purpose of expanding the trade of the Empire and of taking full advantage of all the conditions arising out of the war. Among the principal general questions which required attention, he said, were the increase of banking credits in so far as they affected industry; the establishment of an efficient commercial Consular service, kept directly in touch with the requirements of British manufacturers; the careful investigation of railway and freight rates; and the securing of large contracts for Great Britain, which were, in many cases, a result of the large loans floated on the London market. The proposed institute would have an executive selected by trade organisations and an honorary president and vice-presidents should be elected from men pre-eminent in industrial life. Sir Charles Macara, Sir George Reid and Earl Grey, Lord Aberconway addressed the assembly in support of the Institute, Mr. C. J. Fairfax Scott, secretary of the British Iron Trade Association, urged the need of a reorganisation of our Consular service, and the employment in that service of thoroughly trained business men. In conclusion, the resolutions were proposed and carried forming an organising committee to take steps to incorporate the Institute.

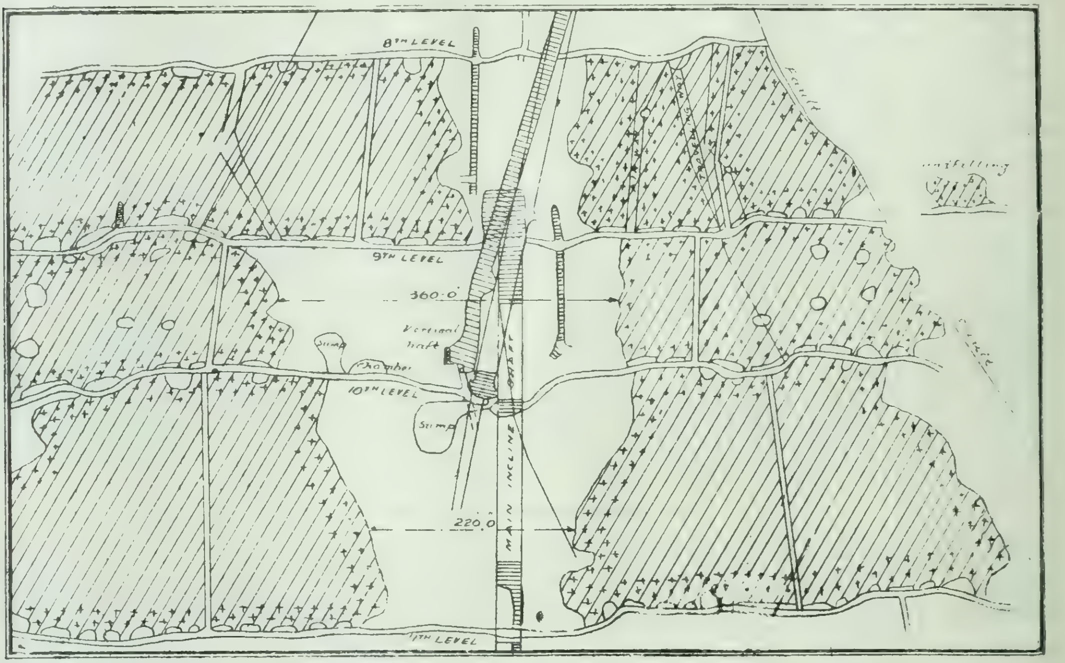
New Modderfontein.

The report of the directors of the New Modderfontein for the quarter ended the 30th of September shows that a working profit of £166,439 was made, equal to 21s. 3d. per ton milled. The total working expenditure was £116,370, equal to 14s. 10d. per ton, and the revenue from gold £282,809. The results for the quarter reveal only minor differences when compared with the previous quarter. The tonnage milled shows a small increase and has reached the full capacity of the reduction plant; the yield was practically unchanged, while working costs were reduced by 5d. per ton to an average of 14s. 10d. per ton milled. The working profit realised, owing to these factors, was £9,219 higher. Development footage increased 922 feet. The reef disclosures were satisfactory, though not so high in value as in the preceding quarter.

THE UNIQUE SUBSIDENCE AT THE VILLAGE MAIN REEF.

Value of Sandfilling—Are Solid Pillars Useless?—Important Controversial Points Raised.

THE accompanying plan shows the position at the Village Main, of the working in the Main Reef Leader in the immediate vicinity of the main vertical shaft, which is the chief outlet from the mine. The area which has been sandfilled in this district is shown clearly by hatchings. The overlying South Reef has also been closely packed. For a considerable distance round the shaft no open areas exist, *i.e.*, the whole space consists of either sandfilled stopes or solid ground. It was the solid ground, which was affected by the recent rock movement. The only feasible explanation is that the hanging wall has slowly subsided on to the packed sand until no further movement was possible. As this subsidence must also include the area held up by the solid rock pillar, it is clear that the latter had reached a state of acute tension, which was disturbed by a general movement of the overlying strata. This was sufficient to burst away the sides of the pillar, filling the drives with debris and damaging the shaft timbers. The interesting feature is the fact that the area which could reasonably be regarded as the safest and strongest became under the circumstances the more dangerous and weakest. An inspection of the immediate neighbourhood of the shaft immediately after the occurrence revealed the fact that the workings and drives in the sandfilled area were quite unaffected, no disturbance of the filling being detected. The result of this somewhat unique accident goes to detract considerably from the value of solid pillars, unless they cover an excessive superficial area. Sandfilling appears to be much more effective as it presents a slightly elastic resistance, allowing the strata to gradually subside without breaking the continuity of the hanging wall. The contrast to this is the solid pillar with its puncturing effect. For the plan and particulars here given we are indebted to Mr. Hans Meyer, of the engineering staff of the Central Mining and Investment Corporation.



Scottish Shale Oil.

Mr. R. G. McCully, hon. secretary of the Scottish Mineral Oil Association, writes as follows:—In articles which have been widely published of late regarding the supply of mineral oils to this country, it is observed that no notice is taken of the Scottish shale oil industry, which is the only trade producing and manufacturing mineral oils in the United Kingdom. It is thought by members of the Scottish Mineral Oil Association—which comprises all the companies connected with the shale oil trade—that some information regarding the industry might be of general interest at the present time, and I am desired to present the following particulars: The shale oil industry is established in the counties of Mid and West Lothian and North-East Lanarkshire, where it was founded over sixty years ago. The oil shale occurs near the base of the carboniferous formation in the counties of Mid and West Lothian and the north-eastern corner of Lanarkshire. This shale has been the raw material of the industry during the past half century, and the quantity still available is sufficient to furnish the present annual output for many generations to come. The industry gives steady employment directly to about 10,000 men, and pays about £1,000,000 per annum in wages, besides giving work indirectly to many men in other industries which supply the coal, chemicals, plant and general stores used in the shale mines and oil works. The whole processes of mining and manufacture are carried out by British labour financed by British capital and entirely under British management. The chief products of the industry are: Illuminating oils, naphtha and motor spirit, lubricating oils, batching oil, gas and fuel oils, paraffin wax, paraffin candles and sulphate of ammonia. The companies engaged in the shale oil industry are: The Broxburn Oil Company, Ltd., Glasgow; Dalmeny Oil Company, Ltd., Dalmeny; Oakbank Oil Company, Ltd., Glasgow; Pumpherston Oil Company, Ltd., Glasgow; James Ross & Co., Philipstoun Oil Works, Linlithgow; Young's Paraffin Light and Mineral Oil Company, Ltd., Glasgow.

The De-Tinning Industry.

The Pretoria De-Tinning Company, which has for some time been successfully carrying on an industry for the recovery of the tin from disused "tins," is establishing a branch at Johannesburg.

THE OPPORTUNITY FOR SOUTH AFRICAN INDUSTRIES.

Possibilities of Zinc Smelting and Permanganate of Potash Manufacture—A Crop of Industries Subsidiary to Mining—Wake Up, South Africa!

From the inception of this paper the advancement of local industries has always been a cardinal plank in its programme, and never was the time more propitious for that cause than to-day. The gold mining industry alone could support a whole crop of subsidiary industries, if only the initiative and capital were available to start them. To-day the gold mines are dependent on Oversea sources for the bulk of their supplies. Such materials as cyanide, zinc, mercury, lead acetate, permanganate of potash, detonators, oils, etc., are not produced in South Africa, and in some cases Germany was the principal source of supply. Cyanide we have already dealt with, and its local manufacture is not favourably entertained by those who profess to know. With regard to zinc—which fulfils a most important function in the cyanide process—the export of this metal from the United Kingdom has been prohibited during the existence of the war, and as a large percentage of the world's zinc smelting was carried out in Germany and Belgium, the only market available was America. It is not anticipated that the supply of mercury will be interfered with. A small quantity was produced in Austria, but Spain and Italy are the main sources of supply, and there is every reason to hope that shipments will come forward regularly. Explosives are also of the greatest importance to the continuance of mining operations, but, as the three explosive factories in South Africa carried large stocks of raw materials, it is hoped that there will not be any interruption of operations from that quarter. Of detonators there has been no suggestion of a shortage. Zinc and permanganate of potash are regarded as likely to support permanent industries. Of the former great hopes are being entertained in view of the production of zinc ore concentrates, which is to begin in a few days at the Marico Zinc Mines. A full description of the ore concentration plant appears in this issue. The question of smelting is known to have been seriously considered some time ago by one of the big Rand companies, but the project was "turned down." Whether the altered condition of to-day would make the scheme profitable is worthy of consideration, though all the factors, qualified by the changed economic conditions of to-day, would doubtless have to be carefully weighed. The economics of new industries should in the best interests of the country, be subjected to expert opinion and advice; and "false starts" by amateur industrialists are likely to do more harm than good to the industrial future of South Africa. The South African National Union recently issued an opportune manifesto urging manufacturers in this country to seize the opportunity afforded by the war for developing their business. For some time the factories of the principal industrial countries on the Continent of Europe will be unable to supply any of the goods that South Africa has been accustomed to purchase from them. In Belgium industries are completely at a standstill. Germany and Austria, even apart from the dislocation of business caused by the war, could not export goods to this country, because we are at war with them. In France the general mobilisation has taken enormous numbers of men away from the factories, and production must necessarily be greatly diminished in consequence. The United Kingdom is more happily situated, by reason of the fact that its chief contribution to the fighting forces is its Navy; but some diminution of production for export may be expected. The mills of neutral countries, in particular those of the United States, will be working at full pressure, but their surplus output will go to meet the deficiency in European production. To a greater extent than usual, therefore, South Africa will be thrown upon its own resources. On the other hand, it must be reckoned that manufacturers in the United Kingdom and in the United States will put forward special efforts to secure new custom in the temporary absence of Continental competition, and in some cases the closing of Continental markets will enable them to dump their goods in the markets which are open to them. The moment, at any rate, is ripe for a full enquiry into the possibilities of local manufactures—particularly of articles consumed by the mining industry.

Rand Working Costs and Profits.

The working profits of 50 companies on the Witwatersrand area for October were £1,004,264, or 8s. 9d. per ton milled; outside districts, £38,140, or 14s. 6d. per ton from eight companies; total for October, £1,042,404, or 8s. 11d. per ton for 58 companies. Working costs: Rand, £1,915,909, or 16s. 8d. per ton milled; outside districts, £57,323, or 21s. 9d. per ton; total for October, £1,973,292, or 16s. 10d. per ton. Dividends declared for 1914 to date: Outside districts, £283,242; Witwatersrand, £4,353,976; total, £4,637,218.

Union Mineral Output for October.

The mineral output of the Union for October was of the value of £3,340,790. The output of diamonds is published half-yearly. The figures supplied by the Department of Mines and Industries give the following details:—Gold: Witwatersrand, 699,952 ozs, value £2,973,209; other districts of Transvaal, 30,470 ozs., value £129,432; other Provinces, 26 ozs., value £114; total, 730,450 ozs., value £3,102,755. Silver, 78,128 ozs., value £8,816. Coal, 698,713 tons, value £181,528. Base minerals, other than coal, value £47,691. For the ten months from January last the total were:—Gold: Witwatersrand, 6,643,490 ozs., value £28,389,667; other districts of Transvaal, 302,677 ozs., value £1,285,693; other Provinces, 1,182 ozs., value £5,022; total, 6,987,351 ozs., value £29,680,382. Silver, 741,418 ozs., value £85,588. Coal, 7,216,151 tons, value £1,901,329. Base minerals, other than coal, £900,393; total value, £32,567,692.

Brakpan Mines.

The following are particulars in regard to the October, 1914, output:—Stamps working, 140; running time, 29 days; ore crushed, 56,020 tons; tube mills working, 9; ore hoisted, 66,243 tons; ore from dump, nil; waste sorted, 13·05 per cent.; fine gold declared, 18,542·26 ozs.; value declared, £78,074, equal to 27s. 10·48d. per ton milled; working costs, £51,070, equal to 18s. 2·79d. per ton milled; working profit, £27,004, equal to 9s. 7·69d. per ton milled.

Magadi Soda.

The directors of the Magadi Soda Company, Ltd., have issued a circular to the shareholders stating that from advices received from East Africa the interruption of the construction work is likely to be of considerably longer duration than was originally anticipated. The branch line to the Magadi Lake is entirely under military control, and civilian traffic of any description is only allowed at intervals when considered safe by the military authorities. The final completion and ballasting of the railway by the contractors, as well as the erection of the works at the lake, which is largely dependent on the use of the line, are practically at a standstill. The erection of the subsidiary works, both at Kilindini and elsewhere, which will work entirely on raw material supplied from the lake, has either been stopped altogether for the present or considerably curtailed in order to husband the company's financial resources. All works of this description which will be required on the commencement of trading are sufficiently advanced to ensure that they can be completed and put into working order within the time still required to complete the works at the lake after the resumption of normal operation. In the meantime the company will be incurring expenditure not anticipated in the original prospectus, and the estimates, owing to this delay, are likely to be considerably exceeded. Practically the entire staff in British East Africa has been enrolled in the Defence Forces, and in agreement with the general manager on the spot the board is making such provision as is considered reasonable for them.

"T.C.L." MINING AND PROSPECTING ACTIVITY.

Latest Results from Tin Properties—Effect of War on the Metal Market—Outlook for Rietfontein and Fairview—Marico Zinc Mines.

FROM the report of the "T.C.L." for the quarter ended September 30, we make the following extracts:—

Witfontein No. 371, District Waterberg.—Only a little development work has been done during the quarter. Ore of good grade has been opened up during the period. The ore shoot on the fissure has now pitched under the 150 feet level. The investigation into the treatment of the complex ore developed in the mine has so far yielded unsatisfactory results, and the development work has therefore been suspended pending further investigation.

Mutue Fides No. 1844, District Waterberg.—Development footage for the quarter amount to 648 feet. A large amount of trenching has also been done, and 459 tons containing 7·7% of 70% concentrate were sorted from development rock. The prospects continue promising. Boring for water has yielded disappointing results and has now been stopped, the supply from boreholes being about 3.000 gallons per 24 hours, which is only sufficient for domestic purposes. Investigation is being made with regard to the quantity of surface water which can be collected and stored by means of dams.

Dientje No. 552, District Lydenburg.—Two mynpachts are being selected, the aggregate area being about 292 morgen.

Groenfontein Tin Mine.—The footage for the quarter was 816 feet, 546 feet of which were profitable, 215 feet development and 55 feet prospecting. Ten stamps ran 30 days, crushing 1,291 tons of ore; the slimes pump ran 34 days—accumulated slimes retreated, 1,292 tons of slimes; total tons treated by plant, 2,583, producing 44·80 tons of 69·9 per cent. concentrate. Further alluvial concentrate produced 1·79 tons of 73·4 per cent. concentrate, making the total concentrates produced 46·59 tons of 70·03 per cent. metallic tin. Ore broken but not milled, 245 tons, estimated to contain 11 tons of 70 per cent. concentrate. Owing firstly to the fall in the price of tin and later to the closing of the metal market on the outbreak of war, considerable curtailments in mining and milling operations have been effected which account for the small tonnage treated during the quarter. Considerable expenditure has had to be incurred during the quarter on new plant and in alterations to existing plant, the benefit from which expenditure has not yet been felt, owing to the necessity of restricting operations. Owing to outlays in connection with plant this property shows a loss for the period. In the Zaaiplaats Valley exploration work has been continued by shafting to and driving on the tin-bearing alluvial wash indicated by boring. This work has exposed good tin values, and is continuing to do so. A plant has been erected on the spot for the purpose of recovering tin concentrate from this gravel. The demand for tin is at present extremely limited. In the expectation that conditions must improve later on the company is accumulating its output and not attempting to sell at unremunerative prices. It is hoped that it will be possible to continue operations on the present restricted scale, as closing down would be an expensive matter, but if hostilities are prolonged to any extent and no recovery takes place in the price of tin it may become necessary to close down entirely.

MINING INTERESTS HELD BY COMPANY.

Zaaiplaats Lease.—The development footage for the quarter amounted to 277 feet. Towards the end of this period good tin values were exposed in some of the development faces.

Rietfontein (T.C.L.), Limited.—909 feet of development have been done during the quarter. Ore milled, 3,217 tons, of an average value of 10·15 dwts. Two Nissen stamps ran 73·298 days, with a duty of 21·94 tons per stamp per day. The tube mill ran 74·447 days. 1,042·859 ozs. of gold were recovered, equal to 6·483 dwts. recovery per ton. The quarter's operations resulted in a profit of £106; the first month of the quarter showed a loss of £292. The results obtained from the alterations to the cyanide plant and treatment of slimes recommended by the metallurgical advisers have not come up to expectations owing to the high consumption of chemicals, and the cyaniding of both sand and slimes has therefore been discontinued. The addition of concentrating tables has, however, made a marked improvement by enabling a portion of the gold which was formerly lost to be now recovered. It is hoped that a small profit will in the meantime be made from the gold recovered by amalgamation and concentration only, until such time as a satisfactory subsequent treatment is evolved for the sands and slimes. The values exposed in the mine continue good. The reef has been struck in the third level, but outside the pay shoot which is shortly expected to be met with in driving southward. The future of the mine depends upon the values which will be found to exist in this pay shoot, as also upon the nature of the ore. If the values are as good as in the second level, and if the ore is more amenable to concentration, as is expected it will be, then it should be possible to make a moderate profit. Should later on a means be found whereby the sands and slimes could be successfully treated, then this profit will be increased.

Fairview (T.C.L.), Limited.—514 feet of development have been done during the quarter. 5,280 tons milled, of an average value of 11·95 dwts. Two Nissen stamps ran 79 days with a duty of 33·41 tons per stamp per day. The tube mill ran 79 days. 2,337·438 fine ozs. of gold have been recovered, equal to 8·854 dwts. per ton, showing a profit of £3,379. The working of the plant has been satisfactory. Development on the third level has disclosed good values.

Marico Zinc Mines.—The concentrating plant for dealing with this ore is expected to commence running in November.

Swaziland Tin, Limited.—97·341 tons of concentrate, averaging 71·61 per cent. metallic tin, have been produced during the quarter. During the corresponding period of last year 79·192 tons were produced, averaging 70·941 per cent. metallic tin. It is hoped that it will be found possible to continue the working of this mine during the war.

Barberton Venture.—Prospecting has been stopped owing to unsatisfactory values having been encountered at depth.

The directors record with deep regret the death, since the close of the period covered by this report, of Mr. C. Rube, who has been one of the London agents of the company since its inception.

Natal Coal Outputs.

The Natal Coal Owners' Society, in their statement regarding the October output, how that during the month 33,963 more tons were brought to the surface than during September. The total for last month was 176,435, and for the previous week 142,472 tons. The output at the various collieries in October were as follows:—Dundee, 36.209 tons; Natal Navigation, 30,717; Vryheid (Hlobane), 18,386; Durban Navigation, 17,913; Glencoe, 15,004; Utrecht, 12,400; Hatting Spruit, 10.650; Natal Cambrian, 8,540; Elandslaagte, 7,315; South African, 7,262; Ramsay, 3,138; Fairleigh, 2,678; Natal Steam, 2,592; Ballengeich, 1,433; Newcastle, 1,430; and Wallsend, 765 tons.

One of the first effects of the war, says *Knowledge*, has been to show us how dependent we have become upon other countries for our supplies of chemical products. Most of our drugs of synthetic origin are derived from German sources, and as yet we possess few facilities for supplying the want. Take, for example, the coal tar product saccharin, which is largely used as a substitute for sugar. The supplies still available in Great Britain are very limited, and will probably be exhausted long before the plant for manufacturing it in England can be erected. Again, the dyeing industry is already feeling the pinch caused by the stoppage of importations of German dye stuffs, for only a relatively small proportion of aniline dyes is made in this country. Other directions in which British industries will suffer from this scarcity are to be found in the manufacture of soap, where there will be a lack of potash for soft soaps, and in the photographic industry, which obtains most of its chemicals from abroad. Several committees have already been formed to consider and advise as to the best means of supplying the chemical wants of various British industries. One of these has been appointed by the Board of Trade, another by the Society of Chemical Industry, and a third by the London Chamber of Commerce.

Mr. David Gilmour, who is now with the Gugenheims in Chile, and who formerly held several important positions on the Rand, is on a visit to South Africa.

* * * *

A large number of members of the Institution of Mining and Metallurgy have joined the naval and military services. With a view to the preparation for publication of a complete list, the secretary will be glad to receive the names (and rank, units, etc.) of all members who are serving at home or abroad.

MINING INSTITUTE.

TEACHING CENTRES:—{ JOHANNESBURG AND SCHOOL OF MINES, KIMBERLEY.

Prof. YATES prepares candidates for the following Government Certificates:—

MINE MANAGER'S.
MINE OVERSEER'S.
MECHANICAL ENGINEER'S.
ELECTRICAL ENGINEER'S.
MINE SURVEYOR'S.

by Class, Private Tuition, and Correspondence.

SOME 1914 RESULTS:—
MANAGERS - - - January and May - - - ALL Passed.
ELEC. ENGINEERS - February - - - - - 66% „
MECH. ENGINEERS - June (Kimberley Centre) - - ALL „
MINE OVERSEERS - - - - - - Practically ALL „
NEARLY 200 SUCCESSES. St. James' Mansions, Eloff Street.

Correspondence and Discussion.

Comments on Questions Arising in Technical Practice or Suggested by Articles in the Journal—Views, Suggestions and Experiences of Readers.

The Deluge of Rand Statistics.

A PLEA FOR RELIEF.

To the Editor, *South African Mining Journal*.

Sir,—Some years ago one of the leading people connected with the gold mining industry made a proposal to relinquish the monthly publication of the output figures. Your paper was, if I remember aright, the only one in this country to support the proposal, and in doing so I believe you gave a number of cogent reasons. The present moment, it seems to me, is peculiarly suited for a revival of the idea, and your powerful advocacy would doubtless now secure its adoption. The curse of the Rand from the point of view of the mine employee is this eternal struggle to launch whole army corps of statistics upon an indifferent public each month, quarter and half-year. As a beginning, let us do away with the monthly output list, with its concomitant of cost and profit tables. I believe the industry would benefit from the step.—Yours, etc.,

"SHAREHOLDER."

[As our correspondent states, our views on the subject are entirely in accord with his. The difficulty is to get all concerned to agree. Our readers' opinions on the subject would be of interest.—Editor, *S.A.M.J.*]

How Germany Treats Enemy Traders.

POSITION OF SHAREHOLDERS AND COMMISSION AGENTS.

To the Editor, *South African Mining Journal*.

Sir,—Having followed with interest the information you have given from time to time in regard to the vexed question of trade with the enemy, may I bring to your notice how Germany is proposing to act in this matter, in order that it may be possible to compare the practices of the two Empires. Owing to the difficulty of communicating with Germany and the censorship in force very little information has come through as to the precise steps the German Government has taken with regard to alien enemies trading in that country. A translation of an article by Dr. G. Obst, a well-known lawyer of Leipsic, on the subject of Supervision of Foreign Undertakings, which appeared in the *Berliner Tageblatt* of a recent date is now available. This article is of particular interest to shareholders in companies having interests in German undertakings and to commercial houses with branches in Germany, because it contains an outline of the Proclamation of the Bundesrat giving the separate States powers to deal with alien enemy traders and comments on the position. The measures taken in Germany are considerably more stringent than those adopted by the British Empire to prevent trading with the enemy. Both here and in Germany the principal aim of the Proclamations is to prevent money going to the enemy; but whereas here it is left to the private individual to discover whether any payment will benefit the enemy, in Germany the authorities have themselves taken steps to ensure that money does not get through to the enemy by appointing controllers, and thus relieving the public of the responsibility. It has been strongly suggested here that controllers should be appointed for all alien enemy business in this country, and so avoid the trouble which now arises out of the apparent conflict between various clauses of the Proclamation against trading with the enemy. Under the Proclamation of the Bundesrat, controllers may be appointed where undertakings "are managed or controlled by alien enemies, or whose profits, wholly or partially, are transmitted to an alien enemy country." The adoption of such a policy here would meet the outcry in certain quarters against companies whose shareholders are largely German or Austrian. The German Proclamation is evidently intended to meet similar cases. The appointment of controllers in this country would also meet the argument put forward by branches of alien enemy undertakings to the effect that under our Proclamation they are entitled to receive payment from debtors, but that, if payment to them is refused on the ground that the money would benefit the enemy, they cannot pay their British creditors. As regards agents holding goods on commission, the German officials have evidently met with the same difficulty of dealing with this position as a whole as the authorities in this country, and the supervision does not extend to those persons, while the position of alien enemies who have fled the country without leaving anyone in charge of their businesses with legal power of attorney has also not been dealt with. Taken as a whole, the German system appears reasonable, having regard to the object in view, and is more likely to achieve the end aimed at than the British Proclamations. It is, moreover, not confiscatory, for the controller is to act "under preservation of the property and other private rights of the undertaking," and it might well serve as a copy for our own authorities.—Yours, etc.,

"ENGINEER."

The Black Reef Again!

To the Editor, *South African Mining Journal*.

Sir,—Instead of the Chairman of the New Modderfontein G.M. Company, at the meeting of the 16th inst., informing shareholders that they are working "the Main Reef" with such good results in that property, it would have been fairer to this vast gold-producing country if he had called it by its proper name, viz., Black Reef! Black Reef series covers thousands of square miles of the Transvaal and Free State. It is an inexhaustable series, and can knock the Rand's Main Reef series into a cocked hat. The Germans know all about it and have been keeping this country dark; we stupid English don't know the value of our own possessions.—Yours, etc.,

SCOTT ALEXANDER,
Rand Stratigraphist.

Johannesburg, November 25.

ANSWERS TO CORRESPONDENTS.

J. W. H. (Kingwilliamstown).—Exploration Buildings, Johannesburg, will find him.

G. H. H. (Brakpan).—The address of Mr. Lew Yuk Lin is, we believe, c/o the Chinese Embassy, London.

S.A. and General Investment.

The report of the South African and General Investment and Trust Company, Ltd., for the year to 30th June last, states that the profit, after payment of debenture and other interest, amounts to £20,033, to which has to be added the balance brought forward of £2,027, making a total of £22,060 at credit of profit and loss account. The directors propose to pay a final dividend on the ordinary shares of 2 per cent. (less income tax), making a total of 5 per cent. for the year, to set aside as provision for depreciation of investments £4,000, leaving to be carried forward and for staff bonus £2,295. During the year there was considerable dislocation of business in South Africa due to the labour strikes in July, 1913, and January, 1914. It is impossible to say to what extent the business of the company will be affected by the present war. No doubt values in South Africa will be adversely affected for a time, but perhaps less than in some places, the recuperative and reproductive powers of the country being well known. It is certain, however, that the effects, financial and otherwise, will be widespread, and the directors have thought it prudent to limit the final dividend to 2 per cent. (making 5 per cent. for the year), to set aside £4,000 out of the profits for the year for depreciation and to appropriate the reserve of £8,500 as an additional provision for depreciation in the value of the company's assets.

Rhodesian Section.

LATEST MINING NEWS.

A Pegging Rush at Golden Valley—The Lonely Output—Globe and Phoenix—The Chartered Co.— October Outputs.

Under the energetic management of Mr. O. T. de Villiers, the Oleander property has been showing up quite well of late and the results being obtained are of the most encouraging nature.

* * * *

The tributors of the Arlandzer mine, Messrs. Keir & Rooke, have, we understand, completed the erection of their 10-stamp battery and are now busily occupied with the cyanide plant, all the material required for which being by this time on the spot. The many people interested in this big proposition will be glad to know that its progress is satisfactory in every way.

* * * *

Reports from the Dalny mine make eminently satisfactory reading. In addition to their five-stamp battery, the tributors, Messrs. Macdonald & Sale, have recently put up a five-foot Chilian mill, which introduction will very materially increase their crushing capacity.

* * * *

Another headgear has been erected on the Agnes property and a new shaft sunk. The requisite hauling gear is fixed up and work is expected to be in full swing within a few days. From recent promising results, the management are sanguine of a successful time in front of them.

* * * *

Mr. E. Jessop has pegged off several blocks in the neighbourhood of the Glasgow mine, upon one of which, Kit's Own, he has erected a mill, hired from the Mali mine, and has started crushing.

* * * *

In consequence of the cessation of operations at Bwana M'Kubwa mine, the railway station at that place has been closed down.

* * * *

There was a big rush recently to peg off blocks of land in the Golden Valley district, quite reminiscent of early days on the diggings. The coveted properties were the Night Hawk (the old Moss Rose) and the Duke, which adjoins the Rosaline. There was a large crowd of competitors with their witnesses present when the signal was given precisely upon the stroke of six for pegging operations to commence, and the usual amount of excitement and good-natured disputation ensued, which will probably create some diversion in the Mining Court when the claims come to eventual allocation, says the *Gatooma Mail*.

* * * *

Particulars of the output of gold from the Lonely mine for the month of October, 1914, are as follows:—Mill ran 576 hours; crushed 4,030 tons; yield of fine gold, 694·253 ozs., value £2,918 5s.; slimes treated, 4,030 tons; yield of fine gold, 1,952·496 ozs., value £8,208 14s. 6d.; total recovery of fine gold, 2,646·749 ozs.; total value, £11,126 19s. 6d.; estimated profit, £3,877.

* * * *

The interim report of the Globe and Phoenix Gold Mining Company, Ltd., for the half-year to June 30 last states that the European war has not materially affected the working of the mine, satisfactory arrangements having been made to safeguard the gold and also for the supply of the necessary stores to ensure as far as possible the full running of the plant and development work. The report of the consulting engineer gives the results of development during the first six months of the year. Taken generally, the position indicated by this report is very satisfactory. More particularly, the developments to the north of the 19th and 20th levels have disclosed very rich ore. Referring to the winze from the 20th and 21st levels, Mr. Piper reports it to be a "most encouraging feature."

* * * *

The correspondence which has passed between the Imperial Government and the British South Africa Company in regard to the renewal or otherwise of the Company's Charter was published recently in London in the form of a White Paper. A good deal of the contents became public property over a fortnight ago, but there are some details in regard to finance which have not so far been published. While the Imperial Government decided not to modify at present the administrative and public provisions of the Charter, a supplemental Charter, as is known, will be issued giving effect to the arrangement, to which the directors of the Chartered Company have agreed, "to render possible the establishment of responsible government in Southern Rhodesia, should the Legislative Council desire it and should H.M. Government concur, at some date other than the Charter permits." The full correspondence leading up to this decision commences with a dispatch from the Resident Commissioner dealing with last spring's "pro-Charter" and "anti-Charter" General Election for the Rhodesian Legislative Council and it ends with a letter from the Chartered Company expressing satisfaction that the Colonial Secretary has agreed to the main points raised by the Company, but regretting his refusal to accept the proposal to issue bonds for the construction of public works. The White Paper throws no new light on the disputed question of the ownership of the unalienated land of Southern Rhodesia. Mr. Harcourt, however, expresses regret that it had not been possible for the Judicial Committee of the Privy Council to give its judgment on the matter before it became necessary to make the Government decisions already announced.

Some October Outputs.

ANTELOPE GOLD MINE (RHODESIA), LIMITED.

Plant crushed 3,377 tons, yielding 872·344 ozs. fine gold; cyanide treated 3,039 tons, yielding 920·242 ozs. fine gold; total value of yield, £7,551; profit, £1,475. Short tonnage due to scarcity of water.

BELL REEF DEVELOPMENT COMPANY, LTD.

Plant crushed 3,200 tons, yielding 1,783·4 ozs. fine gold; value, £7,491; profit, £2,059. Small tonnage due to troubles with power plant.

ELDORADO BANKET G.M. COMPANY, LTD.

Plant crushed 5,228 tons, yielding 2,040 ozs. fine gold; tons cyanided, 4,887, yielding 601 ozs. fine gold; value, £11,123; profit, £4,972.

GLOBE AND PHŒNIX G.M. COMPANY, LTD.

Tons crushed, 6,014; yield, 6,828·68 ozs. (in addition to this 651·99 ozs. have been placed to reserve); concentrates, tons treated 266, yielding

MINING EXAMINATIONS.

Private Individual Tuition for Mine Managers, Mine Captains, Mine Surveyors, Mechanical and Electrical Engineers, and Engine Drivers' Examinations. Practical Mathematics and Electrotechnics, Correspondence Lessons where personal tuition is impossible.

E. J. MOYNIHAN, Consulting Engineer, 35 and 36, Cuthbert's Buildings, Eloff Street, Johannesburg, P.O. Box 2061.

491·59 ozs.; sands, tons treated 2,695, yielding 1,990·98 ozs.; slimes, tons treated 1,646,. yielding 650·51 ozs.; total value, excluding reserve, £41,858 8s. 6d.

AMALGAMATED PROPERTIES OF RHODESIA (1913), LTD.

Champion Mine.—Mill ran 606 hours; tons crushed 660, yielding 102·89 ozs. of fine gold; cyanide treated 660 tons, yielding 101·45 ozs. of fine gold; total recovery, 204·34 ozs. of fine gold, valued at £845.

Liverpool Mine.—Mill ran 228 hours; tons crushed 264, yielding 71·53 ozs. of fine gold; total recovery, 71·53 ozs. of fine gold, valued at £296.

FALCON MINE, LTD.

Plant crushed 8,506 tons; average value of ore treated, 55s. 2d. per ton; blister copper and gold produced from tonnage crushed and sinter previously accumulated, 260¾ tons (2,240 lbs.); value, £30,953; estimated profit, £9,041.

GAIKA G.M. COMPANY, LTD.

Plant crushed 3,000 tons, yielding 1,585 ozs. fine gold; cyanide treated 3,037 tons, yielding 193 ozs. fine gold; total value of yield, £7,476; profit, £3,430.

GOLDEN KOPJE PROPRIETARY MINES, LTD.

Plant crushed 7,923 tons, yielding 1,409 ozs. fine gold; total value, £5,921. New plant still absorbing gold.

SHAMVA MINES, LTD.

Plant crushed 48,489 tons, yielding 3,005 ozs. fine gold; treated by cyanide 48,903 tons, yielding 4,431 ozs. fine gold; total value of yield, £31,384; estimated profit, £12,902; working costs, 7s. 7d. per ton.

TRANSVAAL AND RHODESIAN ESTATES, LTD.

Fred Mine.—Mill ran 639 hours; tons crushed 2,050, yielding 1,156·31 ozs. of fine gold; cyanide treated 2,050 tons, yielding 328·07 ozs. of fine gold; total recovery, 1,484·38 ozs. of fine gold, valued at £6,109.

N.G.F. MAIN EXTENSION MINE.

Mill ran 297 hours; tons crushed 149, yielding 45·22 ozs. of fine gold; total recovery, 45·22 ozs. of fine gold, valued at £186.

Brompton Mine.—Mill ran 384 hours; tons crushed 460, yielding 78·55 ozs. of fine gold; cyanide treated 300 tons, yielding 37·4 ozs. of fine gold; total recovery, 115·95 ozs. of fine gold, valued at £476.

QUARTERLY REPORTS.

Consolidated Main Reef.

The Consolidated Main Reef made a profit for the quarter ended the 30th of September of £37,177 12s. 10d., equal to 9s. 10·895d. per ton, the total working costs amounting to £76,586 18s. 2d., or 20s. 4·928d. per ton. The revenue from gold was of an estimated value of £113,764 11s., or 30s. 3·823d. per ton.

May Consolidated.

Report for the quarter ended 30th September, 1914:—The native labour supply has been fairly satisfactory, but during September the shortage of water caused much anxiety. Notwithstanding the shortage of water mentioned, the operations, on being compared with the previous quarter, have been satisfactory. The working costs were slightly higher by 1.2d. per ton, but 730 tons more rock was crushed, and the value of gold recovered shows an increase of 2.2d. per ton, resulting in the working profit being increased by £195.

Geduld Proprietary Mines.

Mine development, etc., for the quarter ended 30th September, 1914:—Shaft sinking, 18½ feet. Development: Driving, 1,195 feet; winzes, 173 feet; raises, 746½ feet; cross-cuts, 14 feet—Total, 2,128½ feet. For the three months ended 30th September, 1914, the footage sampled on the reef totalled 1,555 feet, of which 995 feet gave 6.6 dwts. over 30·6 inches, and 560 feet gave 2·7 dwts. over 38·2 inches. The native labour supply showed a very gratifying increase during the quarter, and enabled the mill to crush about 10,000 tons more than during the previous quarter, while a considerably greater development footage has been accomplished, and a result of the increased tonnage milled the working profit was increased by £4,176.

Rooiberg Minerals Development Co.

The report for the quarter ended 30th September, 1914, states, inter alia:—Revenue and expenditure: Concentrates produced during the quarter, 295 tons of an average assay value of 69·28 per cent. metallic tin. *Revenue from sale of 155 tons concentrates, £14,314; less adjustments on previous shipments, £138 18s. 9d.—total, 14,175 1s. 3d.; sundry revenue, £142 8s. 4d.—total, £14,317 9s. 7d. Expenditure for quarter, £18,072 17s. 10d; realisation charges on 155 tons concentrates sold, £2,096 5s.—total, £20,169 2s. 10d. (*The balance of the quarter's production, i.e., 140 tons concentrates has not been sold nor taken into account.) Note.—(1) No allowance has been made in the above statement for Government profit tax; (2) the average price per ton of metallic tin realised for the sale of 155 tons concentrates was £136 17s. 9d.; (3) during the month of September half wages, salaries and fees only have been paid; provision, however, has been made in the accounts for the normal costs under these headings. Reduction statistics.—Number of stamps running, 10; number of days run, 84.408. Tons treated: From mine, 6,318 quarter ending 30th June, 6,990 quarter ending 30th September; sands and slimes re-treated, 3,223 quarter ending 30th June, 2,782 quarter ending 30th September. Totals, 9,541 short tons for quarter ending 30th June, 9,772 short tons for quarter ending 30th September. Concentrates produced, 295 long tons. Middlings and slimes.—Accumulated tonnage not yet re-treated, 16,066 short tons; estimated average assay value, 2.5% M.T. Capital expenditure.—The capital expenditure for the quarter was £2,329 13s. 6d. A commencement has been made with the construction of a new dam on Hartebeestefontein across a water course some distance south of the old camp workings. Mine, exploration and prospecting.—All work below the 210 feet level has been temporarily suspended. Prospecting on the surface and at shallow depth has been continued uninterruptedly during the quarter with satisfactory results. General. The metal markets of the world have been closed, and dealings are restricted to private sales.

City Deep.

At the City Deep the value of the gold won was £241,520, the total working expenditure £140,285, equal to 21s. 5d. per ton, and the working profit £101,235, or 15s. 5d. per ton.

Luipaardsvlei Estate.

In the quarter ended the 30th of September the Luipaardsvlei Estate had an output of 13,761·949 ozs., and the revenue from gold was £58,765 16s. 1d. The expenditure amounted to £51,061 16s. 9d., equal to 18s. 1·744d. per ton, the profit on working being £6,703 5s. 9d., or 2s. 4·585d. per ton. The profit on accumulated slimes was £1,000 13s. 7d.

Nourse Mines.

In the quarter ended the 30th of September the Nourse Mines made a profit of £46,141, equal to 5s. 11d. per ton milled. The total working expenditure was £152,963, or 19s. 9d. per ton, and the revenue from gold £199,104. The report states that the labour position continuing to show further improvement, it was possible to further increase the tonnage milled, which was 12,600 tons greater than in the previous quarter. The yield per ton was somewhat lower owing to the clean-up in the cyanide works being made lighter, with the object of conserving zinc. This temporary measure was due to the uncertainty of supplies on the outbreak of war, and the working profit was reduced by £4,394, mainly owing to this reason. Results are now again normal.

Modder B.

In the quarter ended the 30th of September the Modderfontein B. made a working profit of £108,455, equal to 19s. 2d. per ton milled. The total expenditure was £89,811, or 15s. 10d. per ton; and the revenue from gold £198,266, or 35s. per ton. The working profit increased £3,279 as compared with the June quarter, owing to an addition to the tonnage milled. During August the new Nissen stamps were brought into commission, and after minor adjustments gave satisfactory crushing results. It has not yet been possible to supply them with ore to their full capacity owing to the labour supply being still restricted. On this account it was necessary to draw on the surface dumps to the extent of 5,943 tons.

Princess Estate and G.M. Co.

Mine development, etc., for quarter ended 30th September, 1914, is as follows: Shaft (No. 2 vertical): Sinking, 184 feet: 8th level ore bin excavation, 9,940 cubic feet. Development: Driving, 982 feet; winzes, 418 feet; raises, 169 feet; cross-cuts, 245 feet. Total, 1,814 feet. The footage driven, risen and sunk on the reef and sampled was as follows:- South reef, 646 feet averaging 8.3 dwts. over 25 inches; main reef, 395 feet, averaging 6.0 dwts. over 58.4 inches. It is estimated that the payable ore (based on the milling width) developed by the above footage is: South reef, 23,649 tons; main reef, 24,302 tons. Total, 47,951 tons. These figures are subject to recalculation at the end of the year when block values are made out. General remarks. Owing to the war the native labour supply was somewhat dislocated, which made itself especially felt on this property, it being an essentially hammer boy mine. The tonnage milled was 900 tons better than during the previous quarter, but development footage had to be cut down temporarily to enable this to be done. A small amount of work has still to be done at the 8th level station of No. 2 vertical shaft, while the work of completing No 1 vertical shaft to the 13th level and cutting the 12th level loading bin is well in hand. Comparing the quarter results with the previous period, the value per ton of gold recovered was less by 1.7d., whereas the working costs per ton show a slight reduction, the net result being a decrease in the working profit of £315.

THE GEOLOGY OF THE SWAZILAND COALFIELD.*—II.

Description of a Hitherto Neglected Field—Extent of the Coal Measure Series—Comparative Analyses of the Different Coals.

[By J. JERVIS GARRARD, F.G.S., M.Inst.M.M., Assoc.M.Inst.C.E.]

The following table of comparative analysis of coal from various points in the different coalfields will be of interest:—

COMPARATIVE ANALYSIS OF COAL FROM THE VARIOUS COAST COALFIELDS.

	ZULULAND.			KOMATI POORT.					SWAZI COAL MINE.						
	I.	II.	III.	IV.	V.	VI.	VII.	VIII.	IX.	X.	XI.	XII.	XIII.	XIV.	XV.
	Ntambanana.	St. Lucia Outcrop 8 miles N.W. of III. 10 ft. (weathered)	Zululand Colls. positions main seam 400 ft. lev. 8ft. 10in.	Outcrop Crocodile River.	Furley Drift.				Top and bottom of seam.	Middle of seam.	B.H. 8 4ft. 3in. Loevy.	B.H. 10 5 ft. Loevy.	B.H. 9 5 ft. Loevy.	Shaft B at outcrop 2ft. 6in.	B.H. 1 4ft. 6in.
					A	B.	C.	D.	After exposure in dumps for 15 years.						
	(*)	(‡)	(§)	(†)	(†)	(†)	(†)	(†)							
Volatile Matter	18·2	20·14	6·87	19·90	4·90	1·00	1·40	1·40	5·90	9·80	18·65	6·85	6·27	16·00	11·58
Fixed Carbon	67·5	41·47	78·29	57·89	69·66	77·70	62·10	71·54	81·80	82·20	71·65	83·11	81·27	72·74	79·40
Ash	13·5	22·44	12·60	15·81	24·84	20·70	36·00	26·56	8·54	5·61	9·18	9·00	11·32	7·76	8·60
Moisture ..	0·8	15·35	2·23	6·40	·6	·60	·50	·50	3·20	1·85	0·68	0·53	0·69	3·50	0·42
Sulphur ..	0·79	·73	·48	(Trace)	1·30	·80	·48	·36	·56	·54	0·45	0·51	0·45	0·71	0·51
Spec. Gravity	1·415	1·6	1·49	—	1·68	1·57	1·78	1·72	1·50	1·40	—	—	—	—	—
Evap. Power	—	—	11·85	(9·62 Dried sample)	11·22	11·22	9·28	10·78	13·56	14·59	12·1	11·3	11·1	11·75	13·0

(*) J. J. Garrard, Report on Mining Industry of Zululand, 1896, p.p. 37—43.
(†) H. Kynaston, Geology Komati Poort Coalfield, p.p. 24—6.
(‡) C. S. Gray, Report on Mining Industry, Natal, 1904, p. 18.
(§) C. S. Gray, Report on Mining Industry, Natal, 1903, p. 14.

These analyses show that while portions of the various coalfields point to the existence of coal of a distinctly anthracitic nature, other portions of the same three fields contain coal of a semi-bituminous character. In Zululand III. is close to the top of the coal measures and distinctly anthracitic. I. and II. are both near the lower portion of the measures and semi-bituminous. In the Komatipoort Coalfield, V., VI., VII. and VIII. from near Furley Drift are situated near the upper limit of the coal measures, and are particularly anthracitic in nature and of poor quality, whilst IV. from Crocodile River outcrop is situated near the base of the measures and is semi-bituminous. In Swaziland IX., X., XII., XIII. and XV. are situated in the lower portion of the same measures, but some distance above the base, and are distinctly anthracitic, whilst XI. and XIV. appear to be lower seams and semi-bituminous in nature. In the case of IX. and XI. the two places are only 400 yards apart on the surface. The quality of the Swaziland coal in the main shaft IX. and X. is quite exceptional, and represents an excellent anthracitic coal. The quality of the coal in B.H.8 and the shaft B. on the outcrop (with ratios of fixed carbon to volatile matter of 3·8 to 1 and 4·5 to 1 respectively, as against 4·4 to 1 for Welsh steam coal) would seem to indicate the possibility of encountering steam coal of good quality in the lower portion of these measures. I would here take the opportunity of calling Mr. Kynaston's attention to an obvious error on page 26 of his report on the Komatipoort Coalfield, where he says: "The high percentage of ash which is especially noticeable in the case of Seam C. (No. VII. in my table) is somewhat detrimental to what would otherwise constitute an excellent steam coal." It is quite evident that no coal with only 1·4 per cent. of volatile matter, however little ash it contained, could ever make an excellent steam coal. In this connection arises the interesting question as to the real cause of the anthracitation of coal, which is commonly assigned to the action of adjacent igneous rocks in driving off the volatile constituents. My observations generally have indicated (1) that where eruptive rocks in the form of dykes intersect a coal seam the tendency is to produce coked or cindered coal in the immediate vicinity, but not anthracite; (2) that eruptive rocks in the form of thick sills, if sufficiently close to the coal seam, produce—by means of a kind of slow coking action—a "bastard anthracite," *i.e.*, bituminous coal, less most of its volatile hydro-carbons, but with still the same amount of original ash which has consequently become increased in percentage in the altered product. This represents a good deal of the so-called anthracite found in South Africa. (3) That one sometimes meets with thin sheets of eruptive rock actually intruded as layers in the middle of a coal seam which also has the effect of producing the "bastard anthracite" mentioned above. (4) That no satisfactory explanation appears yet to have been arrived at to account for the true anthracitation of coal under the many varying circumstances attending its occurrence in different parts of the world, and especially as regards any satisfactory explanation of the fact that in the case of true anthracite the percentage of ash is no higher, and is frequently lower than in the case of bituminous coal often in the same seam in another part of the same coalfield. I have sometimes thought that it might possibly be due to the effects of earth movements resulting in the tilting and fissuring of the coal measures, with consequent local increase of subterranean temperature. Anthracite can, therefore, and does, occur in regions where eruptive rocks are not present, and the fact of these rocks being intruded subsequently into the fissure already existing does not necessarily imply that they should affect the coal, except where a dyke actually cuts through the coal, or in the case of a close proximity of an intrusive sill to the seam, as already stated. In France anthracite is usually found in rocks more metamorphosed than those containing bituminous coals.[1] In considering the coast coalfields in question, it would appear that the types of bastard anthracite, true anthracite and bituminous varieties are all represented here. The bastard anthracite by the Furley Drift and Teubosch coals in the Komatipoort field, mentioned by Mr. Kynaston, which contain a very high percentage of ash, by certain seams in the St. Lucia coalfield, and by the outcrop coal in Swaziland on the Umtintegwe River, where an intrusive sill appears interbedded in the seam. The true anthracite is represented by the main seam of the Zululand collieries in the St. Lucia coalfield, in which the percentage of ash is no more than in the case of average South African bituminous coals, and by the seam opened in the workings of the Swazi Coal Mines shaft, in which the percentage of ash is considerably less than in the case of bituminous coal generally in the South African coal measures. The bituminous coal is represented by the outcrop on the Crocodile River in the Komatipoort coalfield, by the coal in Shafts B. and B.H.8 of the Swazi Coal Mines, and by the Ntambanana seam in Zululand. From my knowledge of these occurrences it would appear that in the case of the three points where bituminous coal exists the seams lie beneath the more anthracitic seams, although the evidence on this point is not perhaps absolutely conclusive as yet. It would appear, however, that in each case these seams occur as the lowest in the whole coal measure series, a feature which would militate against Mr. Kynaston's suggestion that a possible cause for the anthracitic character of the coal at Komatipoort might consist in the great pressure of the enormous overburden to which the coal seams must have been subjected, having been overlain by the vast pile of strata constituting the Volcanic Series.[2] It is clear that the greatest pressure would exert itself on the lowest seam, which happens to be the most bituminous one.

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*A paper read before the Geological Society of South Africa on 9th November, 1914.

THE VOLCANIC SERIES.

The fine-grained sandstones which occur at the top of the coal measures are overlain conformably by amygdaloidal basalts and the rhyolites of the Lebombo Range. The former occupy the low lying country to the west of the Lebombo Mountains in the form of a long narrow strip from the northern to the southern boundary, and are precisely similar in character to the rocks overlying the coal measures at the Zululand Collieries in the St. Lucia coalfield to the south, and at the Ntambanana coalfield still further south in Zululand.[3] The rhyolites in turn overlie the amygdaloidal basalts and form the main range of the Lebombo Mountains, which extends into Portuguese territory north of the Great Usutu River, and into Tongaland south of the Great Usutu River. These rhyolites are a series of acid lavas, varying in structure and composition from place to place to such an extent that only a lengthy study of these rocks could enable a detailed description of them to be given.

THE INTRUSIVE ROCKS.

These consist (a) of dolerite sills and dykes intruded into the whole sequence of rocks above described. In the outcrop of coal in the bed of the Umtintegwe River I noticed a sill 18 inches thick intruded in the middle of a thick seam of coal, but apparently extending into the seam for a short distance only, probably an offshoot from a vertical dyke noticed close by. The effect of this sill had clearly been to harden the nature of the coal which was thus rendered more capable of resisting the action of the weather and results of storm-water in the river. In fact, it is quite likely that had it not been for the presence of this sill this outcrop would never have been in a position to be seen; (b) of the intrusive mass of granophyre constituting the Mananga Mountains described by Mr. Kynaston[4] which continues some miles southwards into Swaziland, and I have also noted a similar intrusion of granophyre some 30 miles further south, crossing the head of the Malaola Spruit and running southwards from there to the foot of the Stegi Hill on the main Tembe Road; also what is apparently another spur of the same intrusion is seen crossing the same main road on the top of the Lebombo Range a little to the west of the Stegi Hotel. These intrusions are seen to cut through the amygdaloidal basalts which are found between the two spurs above mentioned. In this connection it is of interest to note that Mr. W. Anderson remarks:[5] "The igneous rocks which form the Umquema Range are, so far as my knowledge goes, different from the other igneous rocks of Natal and Zululand. They appear to be older than the Table Mountain sandstones, which, with the Ecca shales, can be seen to rest unconformably against them. They are evidently rocks of deep-seated origin, but are quite distinct from the old granite. They have not been microscopically examined in any detail. They are exposed also further to the north on the track to Lebombo Magistracy ten miles west of the latter place, and, as I mentioned in my last report, they will probably be found still further north in connection with the granitic area in Swaziland." While the "granitic area in Swaziland" must be taken to refer to the older granite and allied rocks which occupy such a large proportion of the country, and which Mr. Anderson specifically states are distinct from the Umquema rocks, it is very possible that these latter may coincide with the Mananga granite rocks, as the most northerly point mentioned by Mr. Anderson would not exceed 80 miles from the occurrence noted by me at Stegi; whilst it is of course possible that further occurrences of the same rocks may occur both further north and south between these points, and that in effect there may be a more or less continuous line of intrusion of these rocks following approximately the western edge of the Lebombo rhyolites. Mr. David Draper, writing about the Lebombo Range, remarks that[6] "This range, consisting of a great thickness of igneous rock (rhyolite according to Professor Judd) has a distinctly stratified appearance and dips towards the east, and its characteristics and position have always been somewhat of a puzzle both to myself and others. At one time I thought that it represented a great dyke, but on closer examination this idea has proved untenable. I have lately visited and examined it more carefully in company with Professor Molengraaff, and the conclusions which I have arrived at, and which I believe he shares, is that this range most probably represents the pipe amygdaloid which crowns the summit of the Drakensberg from Harrismith southward and eastward to Molteno, and that it does not indicate the position of a dyke or line of fissure eruption, as is generally supposed." Although, therefore, the rhyolites of the Lebombo Range do not in themselves form a dyke, as was once thought, there is at all events some evidence that definite acid intrusions of the type of the Mananga granophyre do occur along the western edge of this range. This being so, is it not possible to associate these acid intrusions with the period of the acid lava flows themselves?

GENERAL CONCLUSIONS.

It may be taken to be generally admitted that the red beds cave sandstones and volcanic group of the Stormberg series are probably represented in the Komatipoort coalfield by the beds overlying the coal measures, which beds furthermore correlate with the bushveld sandstone and amygdaloids of the Springbok Flats which overlie the coal measures in that district. There is no doubt whatever of the actual continuity of the Komatipoort series of beds with that of Swaziland, and little if any doubt of the same continuity southwards into Zululand, where the coal measures are also overlain by amygdaloidal basalt at St. Lucia and Ntambanana, whilst at the St. Lucia coalfield "in places the coal measures are overlain by horizontal beds of calcareous sandstone,"[7] this being made still clearer by a sketch map in Mr. Gray's report showing the position of these calcareous sandstones immediately underlying what I know to be amygdaloidal basalts, and which therefore correspond probably with the bushveld sandstone in the Komatipoort and Swaziland areas. As regards palaeontological evidence, I have not had sufficient time to collect specimens in Swaziland, but with regard to Zululand in 1896 I wrote: "Leaf impressions of glossopteris are of common occurrence in the St. Lucia, Ntambabana and Qudeni shales, and the genus appears, moreover, to be characteristic of the coal measures of all countries in the Southern Hemisphere, including Australia, India, South America and South Africa generally, and is known to extend from the Upper Carboniferous period to the Triassic period. The other impression found is much more rare; it is a stem of a cryptogamous plant belonging to the family of Equisetaceae which first made their appearance in the Triassic period. It is possibly a stem of Schizoneura, which genus is supposed to have died out in the Jurassic period."[8] It is unfortunate, however, that it cannot yet be said that the palaeontological evidence so far obtained is sufficiently decisive to determine definitely whether the coal measures should be placed in the Beaufort beds or in the Ecca beds, although the stratigraphical evidence would appear to favour the former. The probable identity of the coast coal measures with those of the highveld was pointed out by me in 1897[9] in the following remarks: "It has been assumed that in order to account for the coal measures on the coast being nearly at sea level whilst the coal measures of the highveld are found at an altitude of 5,000 feet some gigantic faulting must have occurred to lower the former. Assuming both to belong to the same geological horizon originally, whilst admitting the possibility of the existence of such faults, the occurrence of coal at more or less gradually increasing altitudes as one proceeds inland from the coast until the altitude of 5,000 feet is reached, would seem to point to a more or less gradual dip of the measures coastwise, and on examination it will be found that an average dip of no more than one third of a degree seawards (an inclination almost imperceptible to the eye) would account for the existence of the Natal coal measures at sea level in the neighbourhood of St. Lucia. Between the highveld coal and that on the coast, what is found in the intervening country usually occurs in isolated hills which have withstood the action of denudation, and which now serve to show the original connection, much in the same way as the pillars left by contractors in excavations show the original height of the ground previously. These connecting links seem to prove more conclusively than any palaeontological evidence the original connection between the known coal measures of South-East Africa, especially when coupled with the fact that the dwyka conglomerate occurs underlying the coast coal beds, and also at an altitude of some 3,000 feet underlying the coal beds in the Qudeni Range, which undoubtedly were connected with the Natal coal measures originally." There seems little reason, therefore, to attempt to explain the relative position of the coal measures in the high and low veld by faulting, as in the case of the "Great Eastern Fault" of Dr. Molengraaff,[10] or by a series of faults as indicated by Mr. Draper.[11] As Mr. Kynaston remarks[13] in view of the great thickness of sediments included in his description of the Komatipoort coal measures, it is quite possible that the uppermost portion of these may be the representatives of the Molteno beds, while the lower portion represents the Beaufort horizon. Although the dwyka conglomerate and Ecca shales are found underlying the coal measures in Zululand, these rocks, so far as at present known, are absent in Swaziland (unless they occur in the southernmost portion not yet examined),[11] and they are also absent in the Komatipoort coalfield.[15] The coal measures in Swaziland and Komatipoort lie directly upon the older rocks. Coal seams have been proved to exist near the top of the coal measures in Swaziland on the Umtintegwe River, in Zululand, at Somkeli (St. Lucia), and near Furley's Drift, in the Komatipoort coalfield. Several seams have been proved to exist in the lower portion of the measures in Swaziland, at the Swazi Coal Mines and on the Hlatuzan and Hloya Rivers further south, and also in Zululand and in the Komatipoort coalfield, and near the middle of the series at Komatipoort, so that it seems reasonable to conclude that coal seams may be expected to exist at varying intervals throughout the whole coal measure series, the thickness of which I have already estimated at about 4,000 feet, and which occupies an area in Swaziland of approximately 700 square miles of outcropping measures and some 1,200 square miles altogether, including the portion overlain by amygdaloidal basalts up to the foot of the Lebombo Range. This is 200 square miles more than the estimated area of the Natal coalfield.[16]

REFERENCES.

[1] Prof. C. Grand'Eury Annales des des Mines, 1882.
[2] H. Kynaston. Geology of Komatipoort Coalfield, p. 55.
[3] Correlated by Mr. Kynaston with the amygdaloids of the Springbok Flats. Geology of Komatipoort Coalfields, p. 35.
[4] H. Kynaston. Geology of the Komatipoort Coalfield, p. 45.
[5] W. Anderson. Third Report, Geological Survey, Natal and Zululand, 1907, p. 133.
[6] D. Draper. Transactions of the Geological Society of South Africa, Vol. III., 1897, p. 140.
[7] C. J. Gray. Report on Mining Industry of Natal, 1904, p. 18.
[8] J. J. Garrard. Report on Mining Industry of Zululand, 1896, p. 35.
[9] J. J. Garrard. Report on the Mining Industry of Zululand, 1897, p. 18.
[10] Dr. Molengraaff. Geology of the Transvaal, p. 79.
[11] D. Draper. Coal Deposits of South Africa. Transactions of Geological Society of S.A., Vol. III., pp. 133 136.
[12] H. Kynaston. Geology of the Komatipoort Coalfield, p. 50.
[13] Ibid, p. 50.
[14] With the exception of the one spot referred to in footnote.
[15] Annual Report of Geological Survey, Union of S.A., 1911, p. 100.

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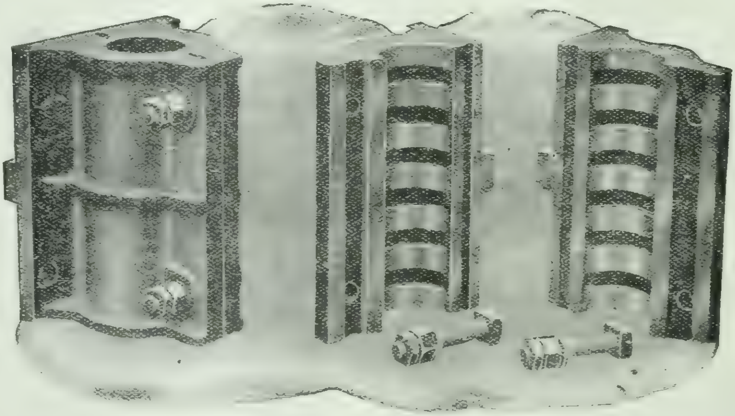

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Engineering Notes and News.

A Business Amalgamation.

The tendency towards amalgamation is evidently not confined to the mines. We hear that the local business of F. Reddaway & Co., Ltd., the well-known rubber and belting manufacturers, of Pendleton, Manchester, which has been carried on at 201, Commissioner Street, Johannesburg, will be taken over by Bartle & Co., Ltd., on December 1st next.

Electrical Accidents.

The smallness of the number of electrical accidents that now occur in generating stations and sub-stations in Great Britain is regarded as due very largely to the skill that has been brought to bear on the design of switchgear and other electrical apparatus. In spite of the rapid growth of electrical installations and the rise of working pressures, the accidents originating from shocks and short-circuits are remarkably scarce. A report recently compiled by Mr. G. Scott Ram, H.M. Electrical Inspector, shows that although the electrical accidents recorded in 1913 were more numerous than in 1912, the number did not exceed that recorded five years ago. Forgetfulness and carelessness on the part of men cleaning and repairing switchboards and live conductors are always accountable for most of the calamities dealt with in these reports. In the present case forty-six accidents in generating stations are placed under this heading, but only one proved fatal. Six occurred to men working on or near high-tension apparatus, and it is remarkable that none of them caused death. Electrical accidents would be almost unheard of if workmen exercised a little more care. That it will be practicable to make switchgear much more safe and fool-proof we do not believe, and it is doubtful if much improvement of this kind is really necessary. What is wanted is simply concentration of thought on the work in hand.

The use of live high potential wires with success for repulsing attack is again reported in Belgium on the river Nethe, between Duffel and Lierre, about eight miles south of Antwerp, where a force of Germans is stated to have been held up by "electrified wire entanglements" and "absolutely shattered."

Resuscitation.

The U.S. Bureau of Mines in Technical Paper 77, gives the report of the committee on resuscitation from mine gases. The committee was composed of doctors. After reviewing the committee report, the Bureau engineers make the following recommendations in cases of gassing or shock. In case of gassing, remove victim at once from gaseous atmosphere. Carry him quickly to fresh air and immediately give manual artificial respiration. Do not stop to loosen clothing. Every moment of delay is serious. In case of electric shock, break electric current instantly. Free the patient from the current with a single quick motion, using any dry non-conductor, such as clothing, rope or board, to move patient or wire. Beware of using any metal or moist material. Meantime have every effort made to shut off current. Attend instantly to the victim's breathing. If the victim is not breathing, he should be given manual artificial repiration at once. If the patient is breathing slowly and regularly, do not give artificial respiration but let nature restore breathing unaided. In gas cases, give oxygen, with manual artificial respiration. The oxygen may be given through a breathing bag from a cylinder having a reducing valve, with connecting tubes and face mask, and with an inspiratory and an expiratory valve, of which the latter communicates directly with the atmosphere. No mechanical artificial resuscitating device should be used unless one operated by hand that has no suction effect on the lungs. Use the Schaefer or prone pressure method of artificial respiration. Begin at once. A moment's delay is serious. Continue the artificial respiration. If necessary, continue two hours or longer without interruption until natural breathing is restored. If natural breathing stops after being restored, use artificial respiration again. Do not give the patient any liquid by mouth until he is fully conscious. Give him fresh air, but keep his body warm. Send for the nearest doctor as soon as the accident is discovered.

T. & D.B. Collieries Equipment.

The Manager of the Transvaal and Delagoa Bay Collieries in his annual report writes, *inter alia*, as follows: The haulages were extended during the year as required. All the underground machinery worked satisfactorily. Referring to the installation of a coal cutter for experimental purposes, mentioned in his last report, the results obtained do not warrant the expenditure which would be necessary to instal coal cutters throughout the mine, but the experimental plant is still kept at work on the very hard faces where it is found useful. The surface machinery is in good working order. The following additions were made during the year: Three cranes and a pug mill. At No. 1 Colliery the original screening and loading plants were thoroughly reorganised, alterations and improvements were carried out to a considerable extent, and we now possess a most efficient and up-to-date plant. At No. 2 Colliery the alterations to the screening arrangements mentioned in my last report were carried out early in the year, and have been working most satisfactorily. The boilers are in fair working order, but owing to the drought the temporary use of neutralised mine water has a tendency to strain the joints. During the year two 250 h.p. Babcock and Wilcox boilers were put into commission. Three motors were added during the year.

THE RAND'S LARGEST CENTRAL POWER STATION.

Brief Description of the Rosherville Power Station of the Rand Mines Power Supply Company, Ltd.

[By V. PICKLES, Associate Member, S.A.I. of E.E.]

When asked to write this paper, I was given to understand by certain members of the Council that simply a broad description of the station was desired, and I have endeavoured to fulfil these requirements as near as possible. You will understand that to go into detail when writing about a station like Rosherville would involve such a lengthy paper that the reading of it would be approaching the impossible. I am therefore giving merely the broad features of the station, and I trust that they will avail themselves of the opportunity of going more into detail of such parts of the plant as they are most interested in. Rosherville Lake, as you are aware, is the largest sheet of water on the Rand, and this was the chief reason for selecting the present site for the power station. The turbine room is 450 feet long and 75 feet wide, and there are five right-angled boiler houses each containing eight boilers. You all know it is both an electric generating station and an air compressing station. The present equipment is five 10.000 kw. turbo-generators generating current at a period of 50 cycles and a normal voltage of 5,000 volts. This for purposes of distribution is stepped up to 20,000 and 40.000 volts. The air compressing part of the station is equipped with six turbo-compressors each capable of dealing with 22,000 cubic feet of free air per minute, with an outlet pressure of nine atmospheres absolute. Three additional sets, two of which are already in service, are installed, each capable of dealing with twice this amount of air. Relatively their sizes are 3,000 and 7,000 kw. respectively. The total capacity of the station is therefore roughly about 84,000 kw.

COAL HANDLING.

Coal is delivered along sidings to five outside storage bunkers, one opposite each boiler house. Underneath the bunker floors are the conveyors, which are fed by rotary fillers through chutes built in the concrete floor of the bunkers. These conveyors are of the Babcock and Wilcox gravity bucket type, and they deliver the coal from the outside bunkers to the overhead internal bunkers, whence it is delivered through mild steel plate chutes into the stoker hoppers. Each conveyor is capable of handling 40 tons per hour. Blake-Dennison weighing machines are installed in each conveyor tunnel, which automatically weigh the contents of every four buckets as they pass over the machines. The total reading is taken and a daily check thus kept on the operation of the station.

THE ROSHERVILLE POWER STATION.

BOILER PLANT.

The general arrangement of the boiler houses consists of a basement 10 feet high, in which the ashes are dealt with. Ash bunkers are provided under each boiler capable of storing approximately six tons. The ashes are removed in trucks and attached to the haulage gear leading to the ash dump. On the next floor are the boilers themselves, and each boiler unit is of the Babcock and Wilcox marine type, fitted with chain grate stokers and each having its own superheater and economiser integral with it. The boilers are arranged in two rows in each house with a common firing floor. The boilers of the first four houses have a rated capacity of 32,000 lbs. of steam per hour, and are capable of evaporating 40.000 lbs. of water under favourable conditions. The heating surface of these boilers is 5,520 sq. ft., of the superheater 1.720 sq. ft., and of the economiser 2 200 sq. ft. In No. 5 boiler house, which is the most recent addition to the plant, the boilers are slightly larger. The heating surface of the boiler is 5,920 sq. ft., of the superheater 2,247 sq. ft., and of the economiser 3,050 sq. ft. The normal output is 33,000 lbs. of steam per hour. The Prat system of induced draught is employed. This system is one found more on the Continent than in England or America. At Rosherville adjacent boiler units are connected to a common chimney, the conical shape of which is probably well known to most of us here. Air from an electrically-driven fan is forced through the conical part of the stack and thereby produces a suction in the flues and consequent draught through the furnace. The fans for double units are driven by 125 h.p. three-phase squirrel cage motors, while those for the single units, that is the two outside rows of boilers in Nos. 1 and 5 houses, are driven by a 75 h.p. motor. The draught is regulated by means of a damper or torpedo shape moving up and down in the conical end of the blast pipe and so regulating the volume of air discharged from the fan. The draught can be varied from $\frac{1}{2}$ in. to 2 in. of water in the uptake. The superheaters and economisers are of the Babcock and Wilcox well-known type and need no explanation.

STEAM PIPES.

Steam is delivered from each boiler unit to a main open steam-pipe ring in each house. The open ends of this ring are connected by vertical pipes to the main steam header running the whole length of the station. Isolating and section valves are of course suitably placed, the main sectionalising valves being electrically operated. At the bottom of each vertical header steam separators are placed, and the whole range is efficiently drained by steam traps. The main header is anchored at several points along its length, and expansion is taken care of by means of swivel expansion joints, a type not usually met with in English practice, but which are, I believe, fairly well known on the Continent.

BOILER FEED SYSTEM.

The boiler feed pumps are turbine-driven. They are nine in number and are installed in the turbine room basement. Each pump is capable of dealing with 280,000 lbs. of water per hour against a working pressure of 225 lbs. per sq. in. The turbines are of the simple impulse type with one stage, and are designed for working at 225 lbs. per sq. in. pressure of steam at a temperature of 350 deg. C. Regulation is obtained by means of a throttle valve operated by the delivery pressure, and the speed is therefore automatically regulated according to the demand on the pump. The suction of each pump is connected to a feed tank placed inside the boiler house above the firing floor, and on the delivery side are connected to a breeches pipe, so that they can deliver into either the common or independent feed range. The exhaust steam from the turbines of these pumps is carried to the feed tanks and is exhausted through nozzles directly into the tank, and thus give up practically all the heat of the steam, and the water is also recovered.

WATER PURIFYING PLANT.

Water from Rosherville Lake is used for "make-up," and, as you know, most of the waters in the reservoirs along the reef consist largely of mine water, and is in consequence very unsuitable for boiler use without treatment. The treatment is carried out by means of an Archbutt-Deeley softening plant with a capacity of about 8,000 gallons per hour. This type of softener appears to be very suitable for the treatment of the very hard water in the lake. As you probably know, the Archbutt-Deeley plant is hand-operated and of the non-filtering type. Chemicals are added and the water is then allowed to settle until all the precipitated substances caused by the addition of the chemicals have subsided. The clear water is drawn off from the top by means of a floating discharge pipe into a large reservoir, from which the make-up pumps draw the water.

TURBO-GENERATORS.

Five turbo-generators are installed, each of 12,000 k.v.a. capacity. The turbine is designed for a working pressure of 225 lbs. and a steam temperature of 350 deg. C., and consists of the h.p. or Curtis stage

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*Paper read before meeting of the S.A.I. of E.E. last week.

and twelve expansion stages of the Rateau type. The main supply to the turbine enters the nozzle box, which contains fourteen nozzles. Four of these are permanently open, and the remaining ten are controlled by hand-regulated valves, these being opened or closed according to the load on the turbine. Speed regulation is taken care of by a throttle governor and an emergency trip is provided which cuts off the steam supply at 10 per cent. over speed. Exhaust steam from the condenser auxiliary turbine is delivered to the main turbine at a point between the Curtis and Rateau stages. The generators are bar wound, having one bar per slot. The complete generating unit consists of the generator and the transformer, but provision is made for connecting the transformer for stepping up either to 20,000 or 40,000 volts, as may be desired. Protection of the generating unit embraces both the generator and transformer with intermediate connections. Inverse time limit overload relays are installed. In the event of a fault developing inside the protection, the unit is immediately isolated by means of the Merz Price protective gear, and simultaneously the excitation is cut down to almost zero to prevent the fault extending. The neutral point of each generator is earthed through a low resistance. The generator rotors are of the non-salient type and are 5 ft. 4 in. in diameter. They therefore have a peripheral speed of about 278 feet per second. Ventilation is obtained by means of fans carried at each end of the rotor, the air being drawn from outside through the air filter. Each set contains its own direct driven exciter, and a standby supply is also provided from a motor generator and a battery.

CONDENSING PLANT.

The condensers for the turbo-generating sets have a cooling surface of 17,750 sq. ft. The auxiliary machinery is rather an interesting part of the plant. Both the air and circulating pumps are on the same shaft, driven direct by a small steam turbine, the speed being 1,500 r.p.m. The air pump is of a type similar to the "Le Blanc," and its action is as follows: Water is pumped from a well and thrown out from the impeller through an entraining guide ring. Air is entrained in the particles of water in the angular space between the impeller and guide ring and is thrown out with them, this water being used over and over again. In order to maintain this water cool, it passes through a cooler placed in the suction pipe. The condensed water is dealt with by a separate pump alongside and in the same casing, a partition between the pumps preventing the condenser discharge water flowing into the air pump. The circulating pumps are two in number, and are placed between the turbine and the air pump. The quantity of circulating water is approximately 800,000 gallons per hour. A common atmospheric pipe is provided in case of the failure of any condenser, and an automatic atmospheric valve connects the main exhaust of each turbine with this common pipe. The water for the condensers is taken from a channel running along the front of the station, and is discharged into a second channel placed alongside the intake. The discharge channel is led to a point some distance away from the intake, and the warm water is consequently discharged as far away from the point of supply as possible. Provision is made for the intake to be gravity fed, but with the lake at its present level this cannot be utilised, and two pumping stations are erected, one on the dam wall on the south side, from which water is drawn from the bottom of the lake at its deepest point and delivered through pipe lines into either end of the intake channel. An auxiliary pumping station is erected at a point midway along the station, but this is only required at peak load times when the station is doing its maximum load. The first-named pumping station contains five electrically-driven pumps, each capable of dealing with 20.000 gallons of water per minute. The latter station is equipped with three similar pumps of like capacity. An interesting method of measuring the quantity of condensed water is employed. A thin plate orifice is inserted in the condensed water discharge pipe, and the difference of pressure across this orifice measured by means of a mercury manometer—a simple "U" tube. The quantity of water passing is proportional to the square root of this pressure difference, and a brass scale fixed to the manometer gives the rate of flow at any instant in lbs. per hour. Half-hourly readings are taken, from which the average weight of water per hour can be calculated. With ordinary care we find that this method of measuring the weight of water is correct to within 2 or 3 per cent.

COMPRESSORS.

As previously mentioned, the station contains nine steam-driven rotary air compressors, six of 3,000 kw. capacity and three of 7,000 kw., or about 40,000 kw. in all, run at a speed of 3,000 r.p.m. These take in air at atmospheric pressure and deliver it into the pipe line at a pressure of 110 to 120 lbs. per square inch gauge pressure, according to the demand on the system. The smaller sets consist of two stages with an inter-cooler between, whilst the larger sets are in three stages separated by two inter-coolers. The stages and the internal diaphragms are water-jacketed, with the result that the air is delivered into the pipe line at a temperature below 100 deg. C. and is cooled during transmission to atmospheric temperature. Each stage contains eight impeller wheels forming the rotor, the air passing through these wheels in series. Between each pair of impellers the air passes through passages in the stator that forms the diffuser when the velocity of the moving air is changed into pressure. The low pressure end of the larger sets is double-ended, the air being taken in at each end, and is discharged from a common duct at the centre. This arrangement automatically balances the end thrust of this stage, but the other stages have to be balanced by special means. The stages are separated from each other by labyrinth glands on the shaft and at the circumference of the impellers, and little leakage takes place between them. The clearance between the grooves and notches of these labyrinths is small, so that any want of balance in the machine would rapidly cause heating of these glands. An automatic non-return valve is provided on the discharge pipe of each machine, and directly the pressure falls below that of the pipe line the compressor automatically discharges to atmosphere. The low pressure stage of the steam turbines of the large compressors is also a double-ended device, so as to secure ample area for the steam without unduly lengthening the blades. The condensing plant is similar to that of the turbo-generators, already described.

SWITCH GEAR.

The switch gear is contained in a switch house at the south end of the building, with cubicles on the outside of the building containing the step up transformers between the generators and busbars. This building has four floors. The top floor contains the lightning arrester gear and the outgoing lines are fed out from this floor. The third floor contains the busbars, both 40,000 and 20,000 volts, and the second floor is the switch floor. The lower floor contains the cable ways, etc. The busbars are in duplicate, selecter knife switches being used for connecting to either one set or other of the bars. The 40,000 and 20 000 volt systems are connected together through a coupling transformer of 10,000 k.v.a. capacity. The switches themselves are three single-phase coupled switches, and are operated from the control board. This control board is placed at the south end and overlooks the whole of the engine room. A large signalling board is placed in such a position that it can be seen at any point of the engine room, and from which instructions can be signalled to the drivers of either the turbo-generators or compressors. As intimated at the commencement of the paper, I have only attempted to give a broad description of Rosherville Power Station. You all know that any one of the items taken could be made the subject in itself of a much longer paper than this. Sketches and lantern slides have been omitted through shortage of time. I apologise for these shortcomings, and hope that the visit to the Power Station will compensate for the lack of detail in this paper.

Fans v. Fire.

The use of electric fans as an adjunct by a fire department in putting out a blaze appears to be novel. In Boston not long ago a fire broke out in a basement of a building occupied by a wholesale paint and chemical concern. The fumes and smoke became so thick that it was impossible for the firemen to enter the basement or direct a jet with any effectiveness, when someone thought of electric fans. Half a dozen of the ordinary 16 inch size were requisitioned by the fire chief, and their breeze was directed down the stairway. After the rear basement windows had been broken to allow of the escape of the smoke and fumes, the fans gradually cleared the basement, so that the firement could work quickly and effectively in extinguishing the flames.

Association of Mining Electrical Engineers.

At the opening meeting of the West of Scotland Branch of the Association of Mining Electrical Engineers, Mr. A. B. Muirhead, Lenzie, the new President, delivered his presidential address, in the course of which he dealt with the things that mattered in the maintenance and repair of electrical plant, and the regulations for the use of electricity in mines. He said that colliery electrical plant required very different treatment in its maintenance and repair from that which was customary in the case of mechanical plant. It had been said that mechanical plant cost little to maintain, whereas the maintenance of electrical plant was a serious item; investigation, however, often revealed the fact that the basis of comparison was unsound. Hitherto it had been the custom to carry on ordinary mechanical repairs at the colliery, and it was amazing how little was known of the actual cost of this work for time and material. The outlays appeared in a general way against the colliery stores and colliery wages bill. On the other hand, an electrical repair was sent out to the manufacturer, and his bill passed through the office and attracted notice because it was a concrete item. Moreover, the singling out of the cost of repairs on electrical plant ignored the greater economy and higher efficiency of electrically-operated plant. If they looked back on the state of the industry as it existed prior to 1904, and took into consideration the enormous development in the use of electricity since that year, they were compelled to acknowledge the high standard of engineering shown in the modern plant as specified, to some extent, in the regulations.

Although the steel works in the Rhineland and Westphalia, especially those situated on the Lower Rhine, are suffering seriously from loss of their export trade, they find some compensation in the large orders for war material and permanent way material. According to a contemporary, Krupp, the Rheinische Metallwaren Fabrik, the Witten works and others which specialise in war material, have been working night and day for weeks past to meet the requirements. These works have lost on an average about 30 per cent. of their men, but some of the principal associations are endeavouring to make good this loss by drawing men from industries that are suffering from depression. The question of employing prisoners of war, especially in mines, has also been raised, as it is of paramount importance to maintain a continued supply of coal. The coal mines in the Ruhr district must now serve a much larger area than before, owing to the cessation of the imports of English coal. Many mines have lost about 40 per cent. of their men by mobilisation, and the supply of coal is diminished by about one half, as the men working at the face have been drawn upon to a much greater extent than those working at the pit bank.

Commerce and Industries.

Steel Pipes and Wire Rope Trade.

In discussing the imports of miscellaneous machinery and appliances into the South African Union the Commissioner draws special attention to the item of tubes and fittings. He remarks that in a previous report he pointed out that Germany was making great efforts to capture this trade by means of her "solid-drawn" tubing. At that time the only weldless tube in the African market was the "Mannesmann," but since then the "Phoenix" (the product of a second German firm) has been introduced. The result of this fresh competition between German firms has led to a keen cutting of prices, which, incidentally, adds to the difficulties of British firms. Wire ropes were imported into South Africa last year to the value of £119,354, as compared with £100,697 and £78,991 in 1912 and 1908 respectively. Mining machinery proper was imported to the value of £765,986 in 1913, as against £689,771 in 1912 and £666,164 in 1908. Of the 1913 total £511,968 represents the value of the machinery supplied by the United Kingdom, £161,191 that supplied by the United States, and £73,939 by Germany. The corresponding figures for 1912 were £483,378, £128,163 and £71,831. In 1913 galvanised corrugated iron was imported to the value of £412,073, as against £445,080 in 1912. To last year's total the United Kingdom contributed to the value of £399,118, the United States £9,170 and Germany £3,070, the corresponding figures for 1912 being £393,337, £49,984 and £1,390.

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German Competition in South Africa.

The report of the British Trade Commissioner for South Africa (Sir Sothern Holland) on the trade of the Union of South Africa and Rhodesia for the year 1913, which has just been issued, includes a section giving a detailed review of the import trade of the Union during 1913, and some of the statistical tables included in this section are of particular interest at the present moment, inasmuch as they indicate the extent to which Germany, among other countries, competed last year with the United Kingdom in the supply of various classes of goods to the South African market. From the table of the value of the imports of general merchandise into the Union of South Africa in 1913, classified according to countries of origin, it appears that the British Empire contributed 66·6 per cent. of the total imports, of which 54·6 per cent. was from the United Kingdom. At the head of the list of foreign competing countries stands the United States, whose share of the trade was 9·5 per cent., followed by Germany, with 8·9 per cent.

* * * *

A South African Meat Trade.

The Union Department of Agriculture has just issued in pamphlet form a report prepared by the Trades Commissioner in London on the prospects of a market for South African meat in Great Britain and on the requirements of a meat export trade. Since the report was written the war has intervened to create altogether abnormal conditions in the world's markets. In the main, however, these are transitory. There is, at any rate, no reason to suppose that the conditions will be less favourable to the creation of a South African export trade in meat after peace is restored than they appeared to be immediately before the war. The outstanding fact in regard to the world's demand for meat and the available sources of supply when Mr. Chiappini wrote his report, was the sudden falling-off in the supplies from North America. With European populations also increasing, and the general standard of living rising rapidly, it is clear that the world's supplies of meat have not kept pace with the demand, and there is an opportunity for any country which is capable of supplementing the existing sources of supply. Australia and the Argentine have each in recent years built up a gigantic export trade in meat; but there is still ample room in the market for South Africa. The difficulty lies, however, in getting the export trade started, and Mr. Chiappini's observations recall the dictum of an American millionaire, to the effect that it is the first thousand dollars that is difficult to make. "Costly and extensive slaughtering and refrigerating plants are necessary"; "considerable scientific knowledge and much business experience is necessary for the efficient and economic handling of the meat and the by-products"; and, again, "only very large numbers of animals can be economically handled." That is all very well; but the day of big things can be left to look after itself. London representatives of leading packing-houses told Mr. Chiappini: "When you have the cattle and sheep in sufficient numbers, and in a fit condition for this market, we will be there to buy them, and we will put up the packing-houses." In the meantime those who wish to see a great export trade built up in this country are on the horns of a dilemma; the stock-raiser cannot profitably raise cattle and sheep in sufficient numbers to create an export trade, because the packer, with his expert knowledge and economical methods of handling the meat and by-products, is not there; and the packer is not there, because the material for him to deal with is not available in sufficient quantities. There is a great opportunity for business enterprise to step in to bridge the gap; but, failing that, there would be much to be said for the intervention of the Government to lay the foundations of a trade which ought to be a source of great and enduring profit to this country.

* * * *

Points for Manufacturers.

The Officer in Charge of H.M. Trade Commissioner's Office at Capetown mentions in connection with the competition experienced from Germany in the import trade of South Africa, that it is essential that British manufacturers who are desirous of competing successfully in the South African market should realise the need for both the manufacture of cheap lines and their universal distribution throughout the Union. It is obvious that the better class articles, by which British firms have made their reputation, meet the needs of the inhabitants of urban communities alone, and are unsuited, by reason of their cost, to the needs of the rural population of the country. It is asserted that if British firms are to succeed in their endeavours to capture the competitive trade of Germany in South Africa, they must apply themselves to meeting the most minute requirements of the market, by manufacturing articles to which the public have become accustomed, irrespective of whether these requirements are in the better classes of cheaper qualities of goods. In this connection it is urged that British manufacturers must give their customers in South Africa credit for knowing the needs of the market, and must place implicit confidence in the South African merchant when he makes known his wants in regard to quality, finish, packing, supply of catalogues, etc. The Officer in Charge of H.M. Trade Commissioner's Office has forwarded copies of letters received by the Imperial Trade Correspondent at Port Elizabeth from certain well-known local firms, detailing the classes of goods which have hitherto been imported largely from Germany and Austria-Hungary, and the reasons for the successful introduction of such goods, among which are aprons, leather bags, blankets, brooches, curtains, cottonades, concertinas, quiltings, hosiery, lace, and underwear. The communications in question may be inspected at the Commercial Intelligence Branch of the Board of Trade, 73, Basinghall Street, London, E.C.

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Johannesburg Municipal Finances.

The Acting Town Treasurer, Mr. M. Glennie, has issued an abstract of the Johannesburg accounts for the year ended the 30th of June, 1914. The gross income for the year was £1,615,832, which is the highest figure reached by the Council up to the present. Of this income £1,501,712 was used to meet ordinary expenditure for the year, £55,000 was set aside to create a Stores Fund and working capital, and £62,179 was transferred to capital for expenditure on various works. This expenditure entailed the net withdrawal of £3,058 from the balance brought forward from previous years, leaving £26,289 at credit of Consolidated Revenue Account. It may be remarked that of the income stated approximately 10 per cent. was raised from Municipal Departments, consisting chiefly of rates levied, water sold, and electric current supplied. The amount of assessment rate outstanding was £29,441 compared with £24,518 for the year 1912-13 and £30,813 for 1911-12. The assessment rate of 2·75d. in the £1 produced £376,082, as against a rate of 2·5d. per £1 for the previous year producing £313,200. The contribution in aid of rates from licences, etc., for the past year was the equivalent of a rate of ·335d. on last year's valuation, as against ·336d. in the £1 on the valuation for the previous year. Similarly, the contributions from trading profits for last year were equal to a rate of ·66d. per £1, against 1·183d. per £1 for the year 1912-1913. The total amount brought to credit of the General Fund Revenue Balances Account, £512,267, was the equivalent of a rate of 3·745d. per £1. Of this sum, an amount equal to 3·192d. per £1 only was actually necessary to meet the cost of general services not provided for by direct income. A sum equal to ·189d. per £1 was added to the Stores Fund and Working Capital, a further amount equal to ·182d. per £1 being appropriated for capital expenditure, the balance equal to ·182d. per £1, representing the surplus on the year's working.

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S.A. Railway Orders.

His Majesty's Trade Commissioner for South Africa, in his very valuable report, has some important things to say about South Africa as a field of operations for the exporters of railway and other manufactured material. He says that the figures "show a very healthy condition in regard to British competition in Government stores during the year 1913." While the total value of these imports from all countries increased by £473,341, the trade of the United Kingdom alone increased by £681,868, which means that other countries have lost considerable ground. The relative percentages show that the United Kingdom's share increased by 10·04, while other British possessions decreased by 3·24 and foreign countries by 6·80. Dealing with the South African imports of railway material, tenders by German and British engineers for locomotive engines and coaches are compared, showing that up to that date German firms were able to underquote British firms. The Union Minister of Railways, in a statement in regard to the policy of the Administration in placing orders with foreign firms, said: "The policy they had adopted in the past was to place orders in Great Britain, even if it cost a little more, and they had carried out that policy regularly. But for some time they had had reason to be greatly dissatisfied with the increasing prices charged by British firms, and he thought there had been some ground for a reasonable suspicion that in the prices which were put into tenders by British firms there had been collaboration. With regard to the order for 34 coaches, tenders were originally only asked for from British firms, but the Railway Board decided that the time had arrived when they should endeavour to introduce a healthier aspect by calling for world-wide tenders. They called for them, and found that on the German firm's offer they saved £22,000, or on the whole order £60,000." As to the foregoing, Sir R. Sothern Holland says "there is no doubt that our competitors will cut their prices as low as possible in order to secure a foothold in this important market, the enormous dimensions of which are clearly visible in the following details of contracts for rolling stock placed by the Union Railways Administration during the last three years." Then follows a table which, summarised, shows that in 1911 South Africa bought new rolling stock to the value of £379,906, in 1912 £714,688, and in 1913 £1,752,112, or no less than £2,846,706 of new rolling stock alone in three years.

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Portuguese Possessions.

For several weeks past the possibility of Portugal, one of Great Britain's oldest allies, becoming involved in the great European war has been evident, and the news to hand of the invasion of Angola by German troops settles the question. From the point of view of Portugal's naval and military strength, the addition of that country to the hostile forces arrayed against Germany and Austria is not important, but although Portugal's place as a Power in Europe is a humble one, she owns colonies of considerable importance. The ports of these colonies, now that Portugal is no longer neutral but on the side of the Allies, will form extremely useful additions to the coaling stations and bases

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for the British Navy during the war. There is little doubt that Germany has had designs on Portugal's colonies, and the possession of them would give the Kaiser some of those places in the sun which he has demanded. Portugal's foreign possessions include Angola, which is bounded on the south by German South-West Africa; Mozambique, which adjoins German East Africa; Madeira; the Azores; Cape Verde Islands; Guinea, on the coast of Senegambia; the islands of St. Thomé and Principe; Goa, in India; Damoa; part of the islands of Timor, Ambeno and Pulo Cambing, in the Malay Archipelago; and Macao and two adjacent islands, in China. The two most important of these are Angola and Mozambique. Angola has a coast line of over 1,000 miles and an estimated population of seven millions. Its exports total nearly 1½ millions sterling and its imports amount to over one million sterling. Among the articles exported are rubber, coffee, cocoanuts, ivory, sugar, wax and vegetable oils, while cotton and tobacco can be grown, but have not been exploited to any extent. The country also contains large quantities of malachite, copper, iron, petroleum and salt, and gold has been found. The ports are Loanda, Benguella, Lobito, Ambriz and Mossámedes. A railway line from Lobito inland, which is designed to link up with the Central African system, is under construction. Mozambique is of considerable importance from the British point of view, because a good deal of the import and export trade of the Transvaal and Rhodesia goes through its ports of Lourenco Marques and Beira. Further, under the decision of Marshal MacMahon in 1872, to whose arbitration the English and Portuguese claims were referred, England has the prior right to purchase Delagoa Bay from Portugal. Under a commercial treaty arranged between the Transvaal and Mozambique in 1909, for a period of ten years, Lourenco Marques obtains 50 to 55 per cent. of the transit trade to the competitive zone of the Transvaal, the balance going to Durban and Cape ports. A definite state of war between Portugal and Germany will enable our war vessels to use the Portuguese ports. So long as Portugal remained neutral the Navy was barred from utilising these ports. Mozambique has an area of about 271,600 square miles, and it exports sugar, rubber, copra, ground nuts, beans, oil seeds, maize, cotton, wax and ivory. The resources of the country, however, have been very little developed, although the agricultural potentialities are reported to be enormous.

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"Trade Within the Empire."

The Canadian Government Trade Commissioner at Capetown wrote to the Pretoria Chamber of Commerce recently:—"In April last you received from this office a copy of the Canadian Trade Index; this book is published by the Canadian Manufacturers' Association. In addition to the list of manufacturers as shown in this book, will you please bear in mind for the information of your members that this office is always at your service for full information of any kind as regards Canada's Export Trade, and this office will also with great pleasure do everything possible to put your members in touch with Canadian buyers of any commodities South Africa may have for export. The value of Empire Trade is being brought home to us now, so this is an opportune time for South African importers to extend their trade with Canada. Canadian export to South Africa increased last year to a total of 4,000,000 dollars, and this was one million dollars better than the previous year. I would respectfully remind you and your members that our producers and manufacturers are in a better position than ever for export trade. The Canadian Government encourages export to South Africa by subsidising a line of steamships for regular sailings on direct service to the extent of 146,000 dollars a year, which means that on all goods imported from America freights from Canada average 2s. 6d. less per ton, then there is the preferential tariff and once more the very essential and important fact—'Trade within the Empire.'—Yours faithfully, W. J. Egan."

* * * *

The South African Wood Trade.

The importance of the lumber trade of South Africa will be recognised when it is stated that in 1913, by no means the largest year of import, 187½ million feet B.M. were imported into the country, of which almost 115 million feet was pine, and 47¾ million feet consisted of flooring and ceiling boards, manufactured for the most part out of the same raw material, says the Canadian Trade Commissioner at Durban. The distribution of the imports are as follows:—

	Ft. B.M.	
United Kingdom	3,864	£40
Canada	7,728,480	31,072
United States	25,038,660	106,931
Sweden and Norway and Baltic Ports	81,653,724	375,800
Other Countries	287,064	1,900
Total	114,711,792	£515,743

Sakalava Madagascar Proprietary Oil Fields.

The secretary writes under date November 24:—"We have this day received the following cable from the company's engineer and field geologist, Mr. S. A. R. Skertchly, M.Inst.M.M., M.I.M.E.: Number 3 well 527 feet deep at 360 feet good show of oil. Shall be glad if you will kindly publish for general information."

At a recent sitting of the Academy of Sciences in Paris, Surgeon-Inspector-General Delorme gave an account of the sanitary condition of the troops. He said their spirits were excellent and their state of health perfect, only a very few being ill. He then read a paper which had been communicated to him on the extraction of bullets and splinters from shells by meant of giant electromagnets.

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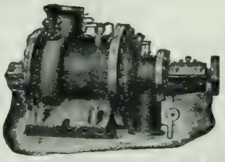

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The Week's Company Meetings.

TRANSVAAL AND DELAGOA BAY INVESTMENT CO.

Excellent Position.

Mr. S. C. Black presided over the annual meeting of the Transvaal and Delagoa Bay Investment Company held in Exploration Buildings on Tuesday. The others present were the Comte F. de Ferreires, Messrs. S. Fleischer, G. Imroth, J. T. Goldsbury, W. J. Dold, E. Friedlander, G. Sonn. and the secretary, Mr. Moses.

Chairman's Speech.

The Chairman said: The report and statement of accounts for the year ended the 31st of August, 1914, which I have pleasure in submitting to you, are again of a favourable nature. The realised net profit, after writing off £7,762 13s. 5d. for depreciation, amounts to £41,382 7s. 11d. We brought forward from last year £92,039 11s. 9d., but we appropriate hereof for further writing down the branch railway line, £5,000; this leaves a balance of £87,039 11s. 9d. and makes the total to credit of profit and loss account £128,421 19s. 8d. We recommend payment of the same dividend as last year—namely, 17½ per cent, equal to 3s. 6d. per share. This will absorb £32,375, leaving £96,046 19s. 8d. to be carried forward, as against £92,039 11s. 9d. a year ago. Cash and equivalent assets aggregate £94,965 2s. 7d. This is an increase of £8,835 12s. 1d. over the previous year. despite the fact that £2,212 7s. 9d. has been written off debentures for depreciation. Having regard to the effect on all securities by the war, we can felicitate ourselves on so moderate a shrinkage of values. Needless to say there is no intention of disposing of any of the company's holdings, either shares or debentures, at the present juncture.

The operations of the Transvaal and Delagoa Bay Collieries are marked by continued progress, the output of 586,175 tons showing an increase of 47,137 tons as compared with last year. Development has proceeded as usual, i.e., concurrently with requirements, and as you will see from the general manager's report, the coal seam maintains its standard of high quality. This description applies also to the coal in the ground purchased last year, and I am pleased to say that further actual mining fully confirms the remarks I made at our last meeting. On that occasion I also referred to the remodelling of the machinery and plant at our No. 1 shaft. This work was completed with customary efficiency and as economically as possible. A few items for which estimates had been prepared were not urgently needed, and outlays in respect thereof have been avoided for the time being. No. 1 pit is now equipped with up-to-date machinery and plant for dealing with an additional large output, but it is not operated at present as our No. 2 pit, with its belt conveyor from seam to surface, can easily produce a tonnage in excess of present requirements. Nevertheless, we regard No. 1 plant as a most useful auxiliary, ready to meet any demand for larger supplies, and invaluable in the event of any accident or breakdown at No. 2. Capital expenditure figures in our balance sheet at £9,365 0s. 4d., which is considerably less than the sum actually disbursed. I may explain that we keep down capital expenditure at all times by allocating as much as is permissible to working costs and when circumstances permit.

Policy of Caution.

During the year under review we dealt in this manner with the following items: £1,238 on boring for water; £2,975 on replacement of underground plant; £376 on alterations to No 2 plant, while not less than £4,182 in connection with the re-equipment of No. 1 plant was treated as renewals and replacements. Thus it will be noted that the sum of £8,771 was transferred to working costs, though it is by no means unusual to include such outlays, or a large share of them, in capital expenditure. The foregoing is the principal reason for our profit not showing an increase commensurate with our larger output of coal. I have no doubt, however, that you will approve of our policy of caution, and that you will concur in our determination to constantly build up the company's finances. A really strong financial position cannot be overrated, more particularly when we are passing through serious and trying times. Our water supply has been affected by the severe drought experienced for several seasons, and we consider it essential to place ourselves in a position of greater security. With this object in view, we are now constructing a dam capable of holding nine to ten million gallons of water, at an estimated cost of £3,000. We possess an excellent catchment area suitable for the purpose, and when the work is completed, within the next few weeks, we hope we shall have definitely overcome the difficulties on the score of scarcity of water. We have erected some new cottages for the accommodation of our staff, and we are now renovating certain others to provide greater comfort. The housing conditions and well-being of both white and native employes continue to claim our close attention, and I am pleased to say that, in consequence, we have a healthy and contented lot of men.

Effect of the Rebellion.

It will be within your recollection that a serious strike took place on these fields in January last. I consider it is fortunate that, despite the industrial dislocation caused thereby throughout South Africa, and despite the outbreak of the European war at the beginning of August, production has proceeded with little interruption, till about the end of October last. Since that date the regrettable events in our midst have caused difficulty in running on certain of the main lines of railway through the O.F.S. It reacts on the smooth working of the collieries, through a shortage of railway trucks, and temporarily interrupts the regularity of output. We expect a restoration to normal conditions before very long, inasmuch as the vigorous measures adopted by the Union Government to suppress disorder in the disaffected parts within the Union can have but one issue; I am firmly convinced that it will be a speedy and successful one. The Transvaal Coal Owners' Association has experienced a trying year for the reasons just referred to, and the management deserve credit for the way in which difficulties have been overcome.

At Delagoa Bay our properties are being carefully supervised by our local agent. There is evidence of progress in the town of Lourenco Marques and suburbs. At the wharves the improved arrangements for coaling vessels afford proof of the desire on the part of the port authorities to keep pace with the needs of shipping. In this connection it is a gratifying feature that there was an increase in export and bunkering coal from Transvaal collieries of some 15 per cent. as compared with the previous year. Landed properties are scheduled as usual in the report before you. A reference thereto shows that we disposed of the surface rights of portion of one of our farms in the Middelburg district, we, however, retaining the mineral rights. You are aware that a number of our Transvaal farms are held in undivided half-interest, the coowners being the Transvaal Consolidated Land and Exploration Co., Ltd. It has been felt for some time that it would be to mutual advantage to make an exchange of areas, whereby each company obtains sole control of the surface rights of full farms and negotiations have been proceeding with this object in view. As a result, an arrangement was concluded during the year by which each company took the surface rights over a full farm in the Rustenburg district, instead of retaining an undivided half-interest in two farms, while the mineral rights remain undivided for 25 years. It is hoped that similar arrangements in respect of the other farms held jointly may be concluded on a fair and equitable basis. Agricultural progress has been retarded by the severe drought of the past year. Recently it has been further interfered with by the curtailment of mining operations by diamond mines, which closed down temporarily on the outbreak of war, and to the unfortunate state of unrest within a portion of the Union of South Africa. An unusual item to which I beg to draw your attention appears in the profit and loss ammount in the form of a contribution made to the National Relief Fund. In addition we have, subsequent to the period covered by the accounts before you, contributed to the local relief funds namely, the Governor-General's and Hospital Ship, as all corporate bodies are doing in our midst, and have joined with our colliery colleagues, members of the Transvaal Coal Owners' Association, towards the contribution of 10,000 tons of Transvaal coal, for the use of the Defence Forces in the field. I am sure you will heartily agree with these donations and that they will have your unanimous approval; I know, moreover, that we all united in unshaken confidence that Great Britain and her Allies will be victorious. We hope this result will be achieved speedily and that thereafter peace and prosperity will be established on a permanent basis. I have pleasure in recording our best thanks to our general manager, Mr. Jas. McPhee, M.Sc., M.I.M.E., for his excellent services. I also wish to express our warm appreciation to the staff and all our employes at the head office, the collieries and Delagoa Bay.

The reports and accounts were adopted, and a declaration of a dividend approved of. The retiring directors and auditors were re-elected. A bonus of £600 was, on the motion of Mr. Goldsbury, voted to the directors. This terminated the business.

New S.A. Companies Registered in England.

CAPE WOOL AND PRODUCE, LTD.

Registered October 10. Capital £25,000, in £1 shares. Objects: To carry on in South Africa and elsewhere business of buyers and exporters of and dealers in wool, etc. Registered office, 97 Wool Exchange, London, E.C. Directors: C. A. Chidell, 97-99 Wool Exchange, London, E.C., Harry von Berg, 36 Mark Lane, London, E.C., and S. A. Chambers, 96 Gresham House, London, E.C.

MINE LUBRICANTS, LTD.

This company was registered on October 10, with a capital of £1,000 in £1 shares, to carry on the business of manufacturers of, dealers in, and agents for grease, oils, lubricants, machinery, tools, colliery and mine furnishings, etc., in the United Kingdom, South Africa and elsewhere. Private company. The number of directors is not to be less than two nor more than four; the first are M. Raffael (permanent) and E. Lewis. Qualification £100. Remuneration as fixed by the company. Registered office, 16 John Dalton Street, Manchester.

PILGRIMS REST CONSOLIDATED GOLD FIELDS, LTD.

This company was registered on October 21, with a capital of £25,000 in £1 shares, to acquire any mines, rights and metalliferous land in the mining district of Pilgrims Rest, and to carry on the business of gold and general miners, prospectors, explorers, etc. Private company. The number of directors is not to be less than three nor more than seven. The first are R. Irvin, G. D. Irvin, J. H. Irvin, R. Irvin, jun., and M. Haskel (all permanent, subject to holding 250 shares each). M. Haskel is managing director. Remuneration as fixed by the company. Registered office: Union Road, North Shields.

NEW RAND PROPRIETARY, LTD.

This company was registered on October 17, with a capital of £30,000 in 2s. shares, to search for, prospect and explore land supposed to contain minerals or precious stones in any part of the world; to carry on the business of miners, smelters, dressers, metal workers, dealers in precious and other stones, gold and other metals, etc., and to adopt two agreements with the New Rand, Ltd. Minimum cash subscription, seven shares. The number of directors is not to be less than two nor more than seven the subscribers to appoint the first. Qualification, 200 shares. Remuneration, £100 each per annum (Chairman £150) and a percentage of the profits. Solicitors: H. E. Warner & Co., 1 Great Winchester Street, London, E.C.

New Patents.

386. Arthur Cyrus Whittome.—An improved air cooling, saturating and/or cleansing device.
387. Robert Wood, Archie McInnes, George Holloway, Charles Oliver Lloyd, Joshua Martyn Mason, Mark Vincent Smyth, Victor Percival Berry.—Natalia motor spirit.
388. James Miners Holman and John Leonard Holman.—Improvements in or relating to pumps.
389. Arthur George Robinson.—An improvement in the manufacture of metal skeleton brass for reinforcement of concrete.
390. Otto Stuhang Ponnesen.—Improved means for extracting jumpers, drills and such like.
391. Frank Wylde Ball.—An improved electrical heating unit and method of manufacturing the same.
392. Thomas Harrison.—A self-emptying truck.
393. John Denham.—Improvements in safety devices for rope hoists.
394. Marie Olive Jennings.—Improvements in reinforcing concrete.
395. Edward Francis McCowl, of Victor, County of Teller, State of Colorado, U.S.A.—Improvements in grinding mills.
396. John Hawes, 9 Buxton Street, Doornfontein, Johannesburg, Transvaal.—Improved portable bath-seat.
397. William Russell Degenhardt, of 1 London Wall Buildings, London Wall, London, in the County of Middlesex, England, formerly of 28 George Street, Kalgoorlie, State of Western Australia, Commonwealth of Australia.—Improvements in apparatus for generating or producing gas.
398. Thomas Patrick Stanton, c/o P.O. Box 668, Johannesburg, Transvaal.—Improvements in boots.
399. Thomas Patrick Stanton, c/o P.O. Box 668, Johannesburg, Transvaal.—Improvements relating to boots, particularly the uppers thereof, and process of preparing the same.
400. Albert Victor Park, 96 Market Street, South Melbourne, in the County of Bourke, State of Victoria, Commonwealth of Australia.—An improved mill for treating ores and the like.
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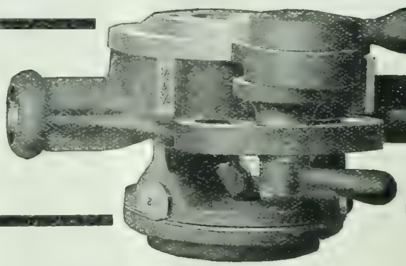

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South African Mines, Commerce and Industries.
ESTABLISHED 1891.

VOL. XXIV., PART I.] DECEMBER 5, 1914. [No. 1210.

HEAD OFFICE: 176-180, Stock Exchange Buildings, Fox Street (2nd Floor), Johannesburg, Union of South Africa.

Telephone **913.** P.O. Boxes **963** and **418.**

Cable and Telegraphic Address: "**MINING JOURNAL.**"

AGENTS FOR GREAT BRITAIN: Argus Printing and Publishing Co., Ltd., Byron House, 82-85, Fleet Street, London, E.C.

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Notes and News.

The End of the Rebellion.

The rebellion is over, the few scattered rebels outlawed, and De Wet captured. That is the excellent result of the week's operations, and it should now allow of the campaign in G.S.W.A. to proceed "as usual.". A gratifying feature of the "round up" of the rebel leader was the part played by the Rand motor car division under Capt. A. H. Bulloch. The assistance afforded to Col. Brits appears to have been considerable.

* * * *

De Beers and Chartered Meetings.

The annual meeting of De Beers is announced for December 30 at Kimberley. The date is about a month later than usual. The Chartered annual meeting will also be delayed, and in the circumstances shareholders will hardly be found to complain.

* * * *

Features Held Over.

Several important and lengthy articles have been unavoidably held over till our next issue. These include a full report on the occurrence at the Ferreira Deep; a report of Mr. Newton's paper on mine dumps; a resumé of the position of the Johannesburg Stock Exchange; and a review of the recently-issued annual report of the Consolidated Gold Fields of South Africa.

* * * *

What is the Value of a Share?

Pitman's are the publishers of an excellent series of tables answering the eternal question: "What is the value of a share?" the various factors essential to its determination being given. The accuracy of the tables is vouched for by the fact that their compiler is Mr. D. W. Rossiter, the well-known head of the Intelligence Department of the Consolidated Gold Fields of South Africa. Mr. Rossiter has prefaced the tables by brief explanations of their application which are "fool-proof" in their simplicity. The work is of an eminently practical nature, and will be found a complete and reliable *vade mecum* to the investor in "terminable annuities."

* * * *

Another Rhodesian Record Output.

The main industry of Rhodesia continues to flourish in spite of many serious handicaps. An analysis of the details is given elsewhere in this issue. Though there is a slump in prospecting, on the whole it may fairly be said that the industry is in a healthy condition, and that the month has marked real and substantial progress. There is the more cause for satisfaction in the fact that there are many newcomers to the list of producers—none, it is true, like the Shamva, the Cam and Motor, or the Globe and Phoenix, but more than one of them distinctly promising, especially in view of the fact that working has been impeded by the shortage of water. The three-millions mark which has for years been the aspiration of Rhodesian mining men has been passed in ten months of the present year, and with favourable conditions it is not too much to hope that in a year or two we will touch four millions.

* * * *

New Randt Reefs.

At a meeting of the New Randt Reefs, Ltd., of which notice was issued to the press generally, the chairman (Mr. F. W. Webb) mentioned the probability that at an early date the directors would have to call a meeting to pass a resolution to liquidate the company. This clearly is the best step to take, for the company's claims are so far on the dip and so small in number that they could not be worked as a separate unit, and a long time will elapse before any adjoining company will want to find money to acquire the ground. The undertaking has apparently been in existence since 1895.

Trade Unions and War.

The executive council of the Miners' Federation of Great Britain have decided not to raise any wage question which might involve an industrial dispute during the continuance of the war, so long as the coalowners maintained a similar policy. We may point out that the owners took the initiative in this respect, as it will be remembered that in the first days of the war the Scotch coalowners withdrew their application for a 25 per cent. reduction.

* * * *

Fall of Ground at Ferreira Deep.

On Wednesday night the Rand was startled by another earth tremor, and on Thursday the head office of the Ferreira Deep despatched the following cable to London for publication: "No. 2 shaft incline round 5th level station collapsed as result of heavy earth tremor last night. Tonnage milled will be appreciably reduced for several weeks." Fortunately no person was injured, and it is understood that the manager, Mr. Trump, is making strenuous efforts to minimize the damage.

* * * *

"T.C.L." and the War.

In the directors' interim report of the "T.C.L." for the period 1st July to 30th September, 1914, it is stated that the surface rights of two farms have been sold at satisfactory prices during the quarter, rights to minerals having been retained in each instance. Owing to the depression consequent upon the war, the business of the Braamfontein Company, Ltd., is almost at a standstill and very few sales of business lots have been effected. Loans amounting to £797 has been repaid in full. Current mortgages have been reduced by £4,250 8s. 4d. New loans amounting to £495 have been made. The mortgage bonds and other advances account has also been increased by the sum of £1,270, representing balances due on properties sold during the quarter transferred from property account, such balances bearing interest, being secured by the properties themselves and being reducible by periodical instalments in terms of the deeds of sale. Enquiries for farms have continued, but on a reduced scale. Reports from the company's stock farms continue satisfactory.

* * * *

The Metal Exchange.

The London Metal Exchange has succeeded in saying goodbye to the last remnants of the moratorium. Henceforth daily settlements will take place as in normal times. Dealings in all metals are now quite unrestricted, and the tone of the market in mail week was considered in authoritative quarters to indicate that the general situation must be "thoroughly sound." Standard copper was then dealt in at £50 per ton for cash and £51 for three months, though the carrying rate was not so wide as is suggested by these quotations. Electrolytic copper was sold at £52 10s. per ton for December and January shipment, and a good, steady inquiry was reported. Tin has developed considerable strength and activity, partly owing to a "lively" trade with America and partly to the restriction of supplies. Latest quotations by cable (December 1st) are:—Standard copper, £55 15s. per ton; electrolytic copper, £58 15s. per ton; Straits tin, £144 5s. per ton for cash and £142 10s. per ton for three months' delivery; English lead, £19 5s. per ton.

* * * *

Union Government Loan.

Negoitations were in progress in mail week by underwriters of pre-war loans, in regard to some re-arrangement of the terms. Thus, the last loan of the Province of Quebec was the 1954 4½ per cent. issue for £1,000,000 at par. Before the close of the Stock Exchange this was 30 per cent. paid, and was quoted at 3½ discount. It has now been agreed by the Province to allow holders to withhold further calls and receive £26 stock for every £30 paid and £63 stock for every £65 paid. The Union of South Africa was also approached in respect of the recent issue of £4,000,000 debentures, but so far no decision has been given, and it is considered that the prospects of the underwriters being relieved are very doubtful. The issue, however, is one of considerable importance, and it is, of course, hoped that the Union Government may be able to make some concession in view of the heavy liabilities confronting the sponsors of the loan. It was, however, only credited as £22 per cent. paid before the war, and it is too much to expect that the Union Government will be in a position to offer holders the option of withholding any further calls.

* * * *

Tanganyika Concessions.

The large number of persons interested in the Tanganyika Concessions, Ltd., will learn with satisfaction that the Union Miniere du Haut Katanga has taken effective measures to ensure the normal continuance of its operations during the present crisis. On the occupation of Brussels by the Germans the Board of the Union Miniere transferred a part of its staff, including the secretary, to the offices of the Tanganyika Company in London, from which the business of the company is now being carried on. The Union Miniere thus expects to reach the output of copper which was anticipated for this year, viz.: about 1,000 tons a month. The realisation of the copper production has already been secured.

* * * *

The Gaika.

There was a marked recovery in the fortunes of the Gaika Gold Mining Company, Ltd., during the year ended June 30 last. Whereas during 1912-13 profits fell—mainly owing to a temporary treatment difficulty caused by an increased proportion of antimony in the ore—to so low a level as to involve the passing of the dividend, on the other hand for 1913-14 two distributions of 1s. per share each have been made, and yet the carry-forward is increased to £14,921, against £13,321 brought in. The net profit earned was £29,127, as compared with £5,838 for 1912-13. The mine did better in all ways, a higher rate of extraction being obtained from richer ore dealt with at a lower working cost. Moreover, development results were unusually good, with the result that the ore reserves at June 30 stood at 100,770 tons, assaying 14·62 dwts. per ton, against 71,893 tons assaying 14·44 dwts. a twelvemonth previously. The consulting engineer, Mr. Piper, writes under date August 10:—"With the exception of the possible water trouble, prospects may be considered very bright. It is too early yet to place much faith in recent developments at the 3rd level south, but they are distinctly encouraging. The bottom of the mine also is more encouraging than a twelvemonth ago."

* * * *

London Stock Exchange Position.

There is a renewal of lively conjectures regarding the date of the re-opening of the London Stock Exchange. The date is variously given as from the middle of December to the beginning of January. Elsewhere we print particulars of the important scheme arranged between the Government, the banks and the Stock Exchange for dealing with account-to-account loans. Next Monday, December 7, the Paris Bourse re-opens for cash operations. Though there is some dissatisfaction in London, the general feeling appeared to be one of satisfaction that a comprehensive agreement had been reached, and particularly over the fact that it had been arrived at without the necessity for a Proclamation. The complaint raised in some quarters that the Government was doing very little was really praise of the scheme, for those who had been responsible for framing it had recognised from the outset the danger of the Government laying itself open to a charge that it had come to the aid of speculators while it had failed to respond to the appeals for assistance made by this or that trade that had been hit by the war. What had been done was simply the issue of a circular embodying an agreement made between the Chancellor of the Exchequer, the banks and the Stock Exchange that would prevent any individual lender from "ratting." True, lenders other than the banks enjoying currency facilities were given relief under a Government guarantee extending to 60 per cent. of their loans, but the hope—indeed, the confident belief—was that the necessity for making application to the Bank of England for advances under the guarantee would arise in only a comparatively few cases.

TOPICS OF THE WEEK.

WEALTH RUNNING TO WASTE.

The recent copious rains have served a double purpose by helping to extinguish the rebellion, and by emphasising, as nothing else could, the crying need for water conservation on a comprehensive scale throughout the Union. Everywhere the rivers are in flood, and a people that has suffered from three years of drought has had another object lesson in the national importance of conserving the water supply. We do not pretend to be able to bring forward any new facts to bear on the question. Our columns in the past have teemed with letters and papers from engineers, dealing with its manifold phases. Indeed, since the classic report of Willcocks, a vast body of literature on the subject has accumulated, including proceedings at Irrigation Congresses, at scientific meetings, reports of Irrigation Commissions and Government Departments, until to-day one is embarrassed by the deluge of facts, figures and general data covering the past results and future prospects in South Africa. A few months before the present war was declared, it will be remembered, a most valuable and interesting paper on "Irrigation, with special reference to the future of engineering work in South Africa," was read by the late Mr. E. K. Steevens before a joint meeting of the S.A. Institution of Engineers and the Institute of Electrical Engineers. The important discussion which followed provoked contributions from Mr. Ingram, Mr. Laschinger, and other specialists, and the discussion is, of course, bound to go on increasing in range and value every day. The lamentable death of Mr. F. A. Hurley, Acting Director of Irrigation, recalls the several excellent projects he framed for application on the Vaal River. It is of melancholy interest to recall that the late Mr. Steevens said of Mr. Hurley's scheme that it "would place half a million acres under irrigation, sufficient to support many thousands of white inhabitants, permanently settled on the land. The river itself would be canalized, and a large part of the traffic along the settlements would probably be water-borne. The site of this scheme lies close to the Witwatersrand, and as such should be of particular interest to inhabitants of Johannesburg and Reef. At present it is shelved, probably because its possibilities are not understood by the public. Sooner or later, no doubt, the community will awaken to the great importance of this project, and will insist on steps being taken to utilise a great national asset at present almost entirely wasted." Despite all that the Union Government has done and proposes doing, it cannot be denied that the terms of the Irrigation Acts have failed to stimulate enterprise, by proving too onerous. Farmers have failed through lack of capital or experience or of specialised engineering ability to advise them. We all know and deplore the fact that many of our rivers carry with their flood waters into the sea immense quantities of soil and organic substances extremely valuable as fertilising agents. A series of low weirs with sluices in each would hold up the greater bulk of such matters, and when the floods have subsided the sluices could be gradually opened, the water drained off, and the deposits allowed to solidify, after which they could be carted away and deposited upon the poorer lands and ploughed in. Or in places where the configuration of the ground is suitable the silt laden flood waters could be led upon such lands direct. Then we have all heard the current belief that South Africa is "drying up." It is to be met with in papers and books, and in many parts of the Union the older farmers point to where streams and rivers once ran, and where numbers of springs were years ago yielding plentiful supplies, which are gradually falling off. Through the observations of rainfall for nearly 50 years, and by the help of other records extending over the period of 50 years before that, it can be confidently stated that there is no appreciable diminution in that respect, but there are other causes which will produce a similar effect, and doubtless the change of climate noticed by these old residents is due to them. It is evident that if vegetation, which prevents the fallen rain from immediately running off the surface and facilitates its soaking into the soil or the porous rock, is destroyed, and its journey to the nearest channel, which conducts it to a stream which leads to a river, and so to the ocean, is assisted, the country will benefit much less by rain that does fall; and practices which bring about these results *do* appear to increase year by year. One of these is the burning of the veld, so that young grass may spring up—an ancient custom of doubtful benefit to the pasturage but of positive harm to the springs; another, the destruction of forests, which, despite the strenuous efforts of the Government to preserve them, seems to go on in some parts; but the principal cause is over-stocking. The evils of over-stocking are not only the too rapid eating down of the grass, but the animals, by passing over the same tracks again and again, make shallow channels for the water to run in after rains, and these gradually deepen, not only quickly carrying away the surface water but draining the ground to some extent below the surface. Thus water which would have penetrated into the earth or have been converted into vapour, to descend again as rain, now is hurried away to the ocean. And this waste of potential wealth is brought home to us all again in the past few days by the rivers in full spate. Indeed, we know of no greater or more vital national necessity than the conservation of this asset and all it connotes.

LOCAL INDUSTRIES AND THE WAR.

Out of the evils of war one good result, at least, may flow, in that it may give a fillip to Imperial industry in general and South African industry in particular. The letter appearing elsewhere in this issue from the Secretary of the South African National Union should have an excellent effect, and the project therein foreshadowed should command general support. An eloquent appeal by Messrs. James Cuning and Arthur Arthur, under the caption "Made in South Africa," has also reached us, and appears to have enjoyed a wide circulation. The only fault we have to find with it is the lack of any constructive proposals beyond the advocacy of a "sample train" and of a mammoth "Inter-Colonial Commercial Exchange." To put it mildly, we cannot "enthuse" over commercial exchanges, and we know many people who believe there is one too many on the Rand already. In our opinion, what is wrong with our local industries is the secrecy of their methods. They seem afraid the public should hear of their existence. If they do not believe in themselves, how can they expect anyone else to do so? To put it in plain language, they must advertise in order to create a demand for their wares. This advice has not been evolved out of our inner consciousness. To be frank, it comes to us from the Union Commission on Trade and Industries that sat under the Presidency of Sir Thomas Cullinan a little time ago. *Inter alia*, that Commission reported: "Manufacturers appear to have failed in the marketing of their wares, and consider the fault to be that the distributor is unsympathetic, forgetting that there is no sentiment in business and that every trader deals in the particular commodity that there is the greatest demand for. One has only to travel about the country and notice the advertisements on the railway hoardings, to see how few relate to South African industries, and unless the South African makers do as manufacturers in other parts of the world are compelled to do, namely, to create a demand for their wares, they cannot expect the merchant to buy them." We do not remember to have seen this advice bettered anywhere, in all the numerous appeals to our industrialists to come out from their hiding places. Prejudice on the part of the public against the use of South African made articles was undoubtedly a serious handicap at one time, but the Commission found that this was disappearing. Another handicap is the excessive cost of living in South Africa. Industries cannot thrive where the everyday requirements of living are expensive; their market is strictly local in such a case, and there can be no hope of entering the world's market at world's market prices unless the cost of skilled labour can be reduced by cheaper rents, cheaper foods, etc. Yet another drawback is the immense size of the country, the want of a large consuming population, and the great distance between markets, which make it almost impossible for any one factory to supply anything but a very limited area. This handicap also acts in another way, as it very often increases the cost of raw materials that are obtainable in the country to such an extent that it is cheaper to import them. It may be useful at this juncture to recall that the Cullinan Commission decided that "the chief drawback" to our industries was lack of capital. We quote from the Majority Report signed by Sir Thomas Cullinan: "Others may be said to be due to industrial handicaps. For example, witnesses were asked to say whether any bye-products were produced in the course of manufacture, and whether they were made use of, and, if not, why not. In many cases the question remains unanswered, and in others the reply was that there was no market in the country. It is not intended to convey thereby that a factory is carried on in an inefficient manner, but that it is unable to find markets for all bye and waste products in the country, and this will only be remedied when industries of a varied character exist, the one using the products of the other. On the other hand, certain industries are in a state of industrial inefficiency, for they have not made use of the bye-products produced or capable of being produced from the raw materials they work up. For example, those who win and refine salt are only now thinking of producing fertilizers, caustic soda, washing soda, etc." The facts regarding lack of capital were also elaborated in the last annual report of the South African National Union. It was shown that possibly many promising industries capable of establishment in this country did not come into being because of the difficulty of obtaining the necessary funds for the preliminary investigations. It is difficult as a rule to find people inclined to risk such initial expenditure. When ascertained facts are available it is possible to get capital for further investigation, but not so in the early stages. It was thought that the Government could do useful work by investigating up to a point the possibilities of certain industries, by analyses, trial shipments to Europe, experiments in South Africa, reports by experts, etc., etc. The South African National Union suggested that a small sum, say £1,000 per annum, might be profitably spent in this manner, under the control of the Minister. Such a sum, if judiciously spent, would go a long way in ascertaining facts about a number of industries, some probably capable of considerable development. The report added: "Unfortunately the Minister could not see his way to accept the suggestion. The recommendation is perhaps a somewhat novel one, but in a young country it is not always possible, or desirable, to work on the orthodox lines of older nations. The development of the industrial resources of the country should undoubtedly be fostered and encouraged by the Government to a reasonable extent. In Australia mining operations in the early stages received State aid in various ways, *i.e.*, by loans to miners for prospecting, advances to companies for the development of mining, or by the use of Government testing plants. It would seem possible to extend such a system to industrial schemes, here, which are in as great a need of assistance as mining enterprises, and certainly deserve equal encouragement."

SOLVING WAR PROBLEMS.

So many of the problems of finance and trade created by the war are common to the whole British Empire that it is helpful to turn occasionally to the efforts successfully being made to solve them outside South Africa. Thus, in addition to the settlement of outstanding Stock Exchange questions, noted elsewhere in this issue, it is reassuring to find that the Imperial Treasury has appointed a committee, consisting of representatives of the Treasury, the Bank of England, the joint stock banks, and the Association of Chambers of Commerce of the United Kingdom, to carry out a scheme for helping British traders. It is delegated to the committee to authorise advances in approved cases in respect of debts which cannot now be collected. The Bank has agreed that no part of the advances, which are not to exceed in any case 50 per cent. of the outstanding debt, shall be applied to the paying off or reducing of loans or bank overdrafts, or meeting unpaid foreign and Colonial acceptances held by traders' own bankers. The banker may call upon the trader to submit to him audited accounts of his business and such other information as to him seems desirable. The necessary forms will be issued by the banks, through which all applications for advances should be made. To guarantee the scheme, the Government will ask Parliament to provide that the ultimate loss, if any, shall be borne to the extent of 75 per cent. by the Exchequer and to the extent of 25 per cent. by the accepting bank. Parliament will also declare the charge upon the outstanding debts valid and effective as against all persons without notification. It is noteworthy also that Mr. Faithful Begg, chairman of the London Chamber of Commerce, in a letter to the Press, emphasises the rapidity with which the business community has adapted itself to the new conditions created by an unprecedented situation. Since the beginning of the war, Mr. Begg points out, the machinery of the Chamber has been kept continuously active, and has proved of great utility in bringing the views of members to a focus. Numerous conferences have been held by representatives of the forty trade sections of the Chamber and of the thirty-six commercial associations affiliated to it. Constant communication has been maintained and exchange of opinions effected with the other Chambers throughout the Kingdom. Having been regularly in touch with these conferences and the resulting communications, he is able to state that the attitude of the business community towards the problems of the time has continued to be as previously mentioned, and not only so, but there has been a steady strengthening of confidence in the future. The experience which has been gained during the period referred to in bringing about partial return to more normal conditions affords ample ground for congratulation and confidence. The chief difficulties have now been overcome, in connection with the re-opening of the Stock Exchange and the re-establishment of the foreign exchanges on a reasonable basis. There are other points which remain for discussion and settlement. For example, a strong movement was organised immediately after the outbreak of war to arrange, if possible, for the fixing either by arbitration or the appointment of a special Court, of terms of settlement either for closing or continuing contracts. This is still advocated by some, but examination has shown the far-reaching nature of the proposal and the extreme difficulty, if not danger, of attempting to carry it out. It was also proposed that the Government should by legislation collect debts due in the British Empire to German or Austrian merchants, and with the proceeds liquidate debts due conversely to British subjects, or make advances against the same. This scheme, however, was quickly abandoned. More recently, Mr. Begg concludes, there has been a proposal that out of the moneys obtained through the operations of the Prize Courts the Government should indemnify shippers whose cargoes have been appropriated by the enemy or otherwise have been lost owing to the war, a proposal which has much to commend it. To these big common problems of Empire, we have in South Africa the special question of compensation for rebel damage, but the Johannesburg Chamber of Commerce, it is satisfactory to know, will go thoroughly into the matter with the Union Government.

WAR AND THE IRON AND STEEL TRADE.

Will the Business Diverted to England Last?—Boom in Sheffield—Shortage of Tungsten Supplies—How Krupps Cornered Molybdenum!

Rand engineers and mining men are naturally keenly interested in the effect of the war upon the iron and steel trades and the market for those metals. Some of the results of the war as chronicled by correspondents in the big engineering centres in England may therefore usefully be given. Most people are aware of the magnitude to which the agricultural machinery and implement engineering industry of Lincolnshire and along the East Coast generally between the Humber and the Thames has grown, and how the European war brought to an abrupt standstill a healthy, flourishing trade with the Continent in most agricultural requirements, including such things as heavy traction engines and threshing machines. It was a very serious blow for the thousands of workpeople engaged, and although recruiting for the Colours rather relieved the situation, the outlook for those that remained looked very gloomy. But these enterprising firms allow no grass to grow under their feet. Foiled in one direction, they promptly turned in another. By a few not very important alterations in lathes and other plant it was possible to make warlike machinery and so share in the boom being experienced in Sheffield. Regarding the general outlook for trade in the Sheffield district, everything appears to be progressing well, according to correspondents, almost every day finding orders upon the books of many firms which formerly went to Germany or Austria. Some manufacturers, it is reported, seem to regard these new orders rather sceptically, believing that with the settlement of European politics things will revert to where they were before the war; but the majority take the opposite view and express full confidence that much of the "diverted" business now flowing into the English markets has come to us permanently. As to shell steel, the requirements are so extensive and urgent that crucible furnaces are being requisitioned. This is a good thing for crucible steel makers, because for some time they have been under a cloud, and whilst they are now experiencing better times, trade for them is still much below normal. As will have been already gathered, steel forges are finding plenty of work, and foundries, too, are very well employed. Rolling mills, whilst not nearly at full capacity, are improving, and in some directions a shortage of skilled labour even is reported. Such a condition applies to people rolling nickel steel for camp kitchens, who, in certain instances, could put on two or three more mills if the right sort of men could be obtained. This shortage of labour is not directly due to enlistment, although, of course, that trouble affects the matter. The fact is that the armament firms are so inundated with orders that no man with anything approaching skill is refused, and men are seeking employment at these works in preference to their ordinary places, because inducements in the shape of extra pay are held out. It is to be feared, however, that labour is not rising sufficiently to the occasion. The exigency of the moment and the spirit of Lord Kitchener's recent message to the armament works require that very special efforts should be exerted just now on patriotic grounds; but it is a question whether, taken as a whole, the men are "putting in all they know." It seems fairly clear that if trade continues to develop—and there seems no reason to doubt it—the shortage of labour, skilled, semi-skilled, and strong unskilled, will become a problem not easy of solution.

Tungsten Supplies.

It looks now as if the threatened shortage has been entirely obviated. At the outbreak of war the discovery was made that Sheffield high-speed steel makers had been leaning upon Germany for the very essential tungsten. It was not that they could not at any moment have put hands upon illimitable quantities of wolfram, from which tungsten is extracted, for in India, in the Colonies, and in Cornwall, there are greater supplies of the ore than may ever be needed. But the difficulty was that the method of producing tungsten had been allowed to become the monopoly of Germany. The sudden cutting of this cource of supply completely aroused people to a sense of the false position into which they had drifted, and efforts were at once commenced to retrieve the situation. The first step was taken by a Luton concern with a strong Sheffield connection, and almost immediately the leading steel manufacturers of Sheffield conferred on the matter, with the result that a committee was appointed to carry out experiments. The first samples of tungsten powder submitted were not a great success, but at the second attempt it was plain that the initial difficulties had been overcome, and the work of forming a company and putting down suitable plant was proceeded with. The company has now been registered as "High-speed Steel Alloys, Limited," with a capital of £50,000 in £1 shares. Practically every leading steel manufacturer, including the big armament works, is backing the company, which commences with a strong Sheffield and Manchester directorate. The works are in Lancashire, and regular supplies of tungsten from this source may be expected from about the early spring.

What Krupps Did.

Sheffield, of course, consumes almost all the tungsten powder made, so that this matter is of great importance to the city, and it is considered that there should be room for both enterprises, the main point being that when the war is over we shall never again find ourselves at the mercy of Germany for such an essential element in tool steel manufacture. The normal price is in the neighbourhood of 2s. 6d. per lb., and it is hoped that the English make will gradually get down to about that. Another important alloy that is very scarce is molybdenum. For a few years back Krupps had been buying every ounce they could secure, and as it is used in big gun making, no further comment is needed.

Birmingham and Coventry Engineering Trades.

An *Engineer* correspondent writes:—"Engineers in the Birmingham district are kept busy in almost all departments. Recently some good orders have been booked for constructional work, and certain branches of the electrical engineering trade are kept going at high pressure. Machinists have more offers of business than they know how to cope with. These relate chiefly to supplemented plants for the execution of 'rush' war orders. Heavy demands by manufacturers at home have coincided with urgent orders from neighbouring nations. There is some reason to believe that carefully masked attempts have been made on behalf of Germany to obtain in this country machines for turning out arms and munitions. Addressing the Birmingham Chamber of Commerce a few days ago, the president said that, on the whole, local trade was quite as satisfactory as could have been expected. The work given out by Government was assisting very much, but even outside these orders there was a fair amount of trade. The exhibition of Austrian and German articles which the Chamber was holding had been of considerable use to manufacturers, and there were many instances where it was leading to the making in Birmingham of articles formerly supplied by enemy countries. An International Commission for the purchase of munitions of war, equipment, and stores for the use of the allied forces having been established in London, the Chamber had offered its services, and as a result many orders had already been placed in Birmingham. All the engineering trades at Coventry able to turn out war material continue to have plenty of orders. Besides heavy ordnance, motor transports, and motor cycles, aeroplane engines are now being manufactured, and overtime is worked in nearly all factories. The repairing of the wastage of the battlefields is likely to keep the several trades going at full speed as long as hostilities last. Businesses which have no direct relation with the war feel the loss of the ordinary trade. But, on the whole, the Coventry engineering trades are doing remarkably well, and are very fortunate in being able to adapt themselves to the new wants."

WAR MATERIAL ORDERS AND THE AMERICAN MANUFACTURERS.

Particulars are published of the manner in which the American iron and steel masters and kindred American manufacturers are benefiting from the war. It is plain that the paralysis of business which existed in the United States before the war began, and which was accentuated by the first weeks of hostilities, promises to be lifted by the continuance of the conflict. Information received is to the effect that the steel mills of Philadelphia are already rushing with war work. The automobile shops are said to be running full time, turning out trucks for France. England, France, and Russia have, it is added, sent agents to Cincinnati for lathes and other machine tools, and a Bethlehem, Penn., company is working on a 5,000-ton contract of steel for bayonets and sabres. These and many other orders evidently mean millions of dollars for American manufacturers. As far as is known no German agents have been placing war orders in the United States, for the obvious reason that German shipping has been swept from the seas. It seems that the American State authorities who, aware of the great influx of business growing out of the war, recently ruled explicitly about the shipment of such merchandise, are consistently adhering to their original ruling, viz., "that there can be no reasonable prohibition against America's trade with the belligerents; that the Government has nothing to do with the shipment of the orders; and that purchasers assume full risk upon the high seas."

TEXT OF IMPERIAL GOVERNMENT'S PROPOSALS FOR HELPING STOCK EXCHANGE.

Repayment of Loans not to be Pressed Until Twelve Months After End of War—Bank to Advance 60 p.c. of Security Values to Lenders.

THE Imperial Treasury has issued it scheme for providing Government assistance in dealing with account-to-account loans on the Stock Exchange, which has an obvious interest for the South African market. It reads as follows:—

With a view to avoiding the necessity for the forced realisation on a large scale of securities held as cover for account-to-account loans, His Majesty's Government has agreed to arrange with the Bank of England to make advances to certain classes of lenders, in order to enable them to continue their loans until after the end of the war. The arrangements agreed upon are as follow:—

(1) The application of the scheme will be confined to account-to-account loans made to members of the Stock Exchange by lenders other than banks to which currency facilities are open. It will not apply to lenders who are themselves members of the Stock Exchange.

(2) All banks to which currency facilities are open, whether clearing banks or not, have agreed not to press for repayment of such loans, or require the deposit of further margin, until after the expiry of a period of twelve months from the conclusion of peace, or after the expiry of the Courts (Emergency Powers) Act, 1914, whichever shall happen first, provided that this agreement shall not prejudice the right to immediate repayment if and when a receiving order in bankruptcy (or the corresponding order in Scotland) is made against the borrower. The rate of interest to be charged on loans continued under this arrangement shall not exceed the rate chargeable by the Bank of England to other lenders under paragraph 4.

(3) Subject to the following conditions, the Government will arrange with the Bank of England to advance to lenders to whom the scheme is applicable 60 per cent. of the value of the securities at present held by the lenders against any loans which they had outstanding on July 29, 1914. Such securities to be valued for the purpose of the advance at the making-up prices of the July 29 settlement.—[NOTE.—In the case of Consols and other securities settling at the Consols account the mean price of the Official List of July 27 will be taken.]

(a) The Bank of England may at their discretion refuse any application, but in the exercise of this discretion due regard shall be had to the object of this scheme, viz.: To prevent as far as possible the forced realisation of securities, and before a final decision is arrived at in regard to any application the Bank will, if the applicant so desires, submit it to the Treasury.

(b) Both the lender and the immediate borrower from the lender shall be jointly and severally responsible to the Bank of England for the repayment of the advance and interest thereon.

(c) All applications for loans under the scheme, giving the particulars required by the Bank of England, shall be made on or before January 31, 1915, and no application will be entertained which is received after that date.

(4) Loans by the Bank of England under the scheme are to bear interest at 1 per cent. above Bank rate, varying with a minimum of 5 per cent. in all. Interest will be repayable fortnightly or, when the Stock Exchange is reopened, at each settlement, and the borrowers will be entitled to coupons and dividends provided that such interest is duly paid.

(5) The Bank of England will not press for the repayment of advances made under the scheme until after the expiry of a period of twelve months from the conclusion of peace or after the expiry of the Courts (Emergency Powers) Act, 1914, whichever shall happen first, nor will the Bank in the meantime require the deposit of further margin provided that this agreement shall not prejudice the right to immediate repayment if and when a receiving order in bankruptcy is made against the borrower.

(6) The borrower may at any time repay the advance in whole or in part. In the case of part repayment the securities to be released will be settled by agreement between the borrower and the Bank of England, or, in default of agreement, will be such proportion of each security as the amount of the repayment bears to the whole advance, provided that where any of the securities are securities held by the borrower against a loan made by him the Bank of England shall release those particular securities upon repayment of an amount equal to the value of the securities at the prices of the July 29 settlement, less the amount of the margin (if any) deposited with such borrower.

(7) When any of the securities against which advances are outstanding, either under paragraph 2 or paragraph 3, reaches the abovementioned prices of the July 29 settlement, the bank concerned, or the Bank of England, as the case may be, shall have the right of calling from the borrowers for the repayment of their loans to the extent of the value of such securities, and should such request not be complied with the bank shall have the right of selling such securities for account of the borrowers, but not under the above mentioned prices.

(8) Lenders taking advantage of the scheme shall be bound by the same conditions as the banks under paragraph 2. In the event of any lender who might take advantage of the scheme not doing so, but seeking to realise his securities, the Stock Exchange as a body shall oppose the application on the borrower's behalf under the Courts (Emergency Powers) Act, 1914. The Stock Exchange Committee undertake to make rules to secure that where any loans have been used for the purpose of making other loans on the Stock Exchange, or for the purpose of carrying over stock the advantages of the scheme shall extend so far as practicable to the clients and other parties concerned.

(9) The Stock Exchange Committee will not reopen the Stock Exchange without submitting the proposed date and conditions of such reopening to the Treasury and obtaining their consent.

Treasury Chambers, London, S.W.

NOTICE ISSUED BY THE LONDON STOCK EXCHANGE COMMITTEE.

The General Purposes Committee of the Stock Exchange issue the following:—

"Committee Room, Stock Exchange,
"October 31, 1914.

"The Committee for General Purposes desire to draw the attention of members to the Government scheme, framed with a view to avoiding the necessity for the forced realisation on a large scale of securities held as cover for account-to-account loans. The alterations to the rules necessary to give effect to this scheme are in preparation, and will be issued shortly. The Committee are happy to be able to announce that in the event of any member having to seek the protection of the Courts (Emergency Powers) Act, 1914, the trustees and managers have agreed to be responsible for the legal expenses. Any member who seeks the protection of this Act is required to communicate with the secretary before taking or defending any proceedings.

"By order,
"EDWARD SATTERTHWAITE,
"Secretary, C.G.P."

The Sheba.

The secretaries write:—I beg to advise you that cable advices have been received from our London office that the directors have declared a dividend of 5 per cent. on account of the current year, payable 2nd January to all shareholders registered on the company's books on the 2nd December. The annual general meeting of shareholders will be held in London on the 9th of December.

PROGRESS OF TECHNICAL EDUCATION IN THE TRANSVAAL.

Steady Advance Recorded by the Education Department—Success of the Trades Schools—S.A. Institution of Engineers and the Question of Apprenticeship.

> *" Faced as this country is with the coloured labour problem, the salvation of the European artisan lies in a higher skill, a better education, and a more complete trade training than the coloured races are capable of. Mere craft practice, mere manual dexterity, the mere ability to repeat a stereotyped process is insufficient in the European, he must be able to write, calculate, and read in the literature of his trade. Anything less the coloured races can do and with sufficient success to displace white labour."—Mr. J. Horne, Organiser of Technical Education.*

IN presenting a brief report upon technical education under the Education Department for the year 1913 it is recorded that a steady advance has been maintained. It is convenient to refer to this under the four divisions into which this form of instruction most naturally falls in the Transvaal.

MANUAL TRAINING.

From the annual report for 1913 we learn that the number of boys attending school, who receive this training for hand and eye, shows an increase; the percentage of pupils receiving manual training in one or other of the three forms in which it is given, *i.e.*, cardboard modelling, woodwork, or metalwork, however, has fallen from 70 per cent. to 67.5 per cent. of attendances. This shows that the extra provision made during the year has not been sufficient to cope with the increase in the number of boys attending school. The greater increase, of course, has taken place in the subject of cardboard modelling; this is due to the willingness shown by head teachers to include this subject in the school course, which necessitates the instruction being given by class teachers with the occasional guidance of the principals in manual training; there has, however, been an increase in numbers in all three branches.

The eastern Witwatersrand area, which was formerly under the guidance of Mr. W. A. Milton, has been made a separate command and placed under the principalship of Mr. D. H. Wheeler. The reduction of the number of classes in cardboard modelling held at manual training centres in the central Witwatersrand area, the establishment of metal work at both high schools in Johannesburg, the addition of a new woodwork and metalwork centre at the Troyeville School, and of new centres in woodwork at Jeppe Central School, at Parkgate (late Irene School, Johannesburg), and at Norwood, necessitated this change; it was felt that the assistance of manual training principals was very necessary to the establishment of cardboard modelling lessons in schools, and that more time was required for this and for the supervision of manual training in high and in primary schools. The result has been a general advance.

In the eastern Witwatersrand area new woodwork centres have been opened at Benoni and Boksburg North schools; full advantage is taken of these, and an additional centre is necessary at Springs. In the western Witwatersrand area no new centres have been opened, but the erection of a new building for the Roodepoort School has enabled the centre there to be housed in the brick building formerly occupied as the infants' department; thus giving a better housing than was obtainable in the former old wood and iron building. The accommodation for metalwork at the Krugersdorp centre was found to be restricted; additional bench accommodation for metalwork has been provided by utilising one end of the woodwork room, and this without affecting the accommodation for woodwork. In Pretoria the accommodation at the Gymnasium centre is becoming overcrowded; in addition the pupil now usually arrives at the end of the course in woodwork during his first term in the VII. standard; thus the additional accommodation required should be provided in the form of a metalwork centre at this central position. The quality of the manual training given at Potchefstroom had been under consideration for some time, and it was finally decided, owing to the necessity for additional centres in Potchefstroom and to the opening of the centre at Klerksdorp, to create a principalship in manual training embracing both towns.

The staff of manual training instructors includes men with the highest practical workshop training and little teaching experience alike with those of the highest scholastic attainment and little bench practice: the result has been that, with one or two exceptions, schemes of work in manual training have not been sent in for approval, and when they have been received have been little else than brief extracts from the code syllabus in this subject; here, of course, those of the larger manual training centres are not referred to. Some guidance on this matter is essential; this might take the form of suggestive headings to the divisions which the scheme of work should show, together with an exemplary scheme of work. The difficulty is to prevent the smothering of initiative by the wholesale adoption of a stereotyped model as something final. Manual training has a subjective as well as an objective bearing, a fact too often lost sight of. The preparation of the guiding scheme of work referred to is, therefore, a matter requiring some thought. Another point on which consideration is required is the temporary exchange of instructors for from three to four months between the agricultural towns and the larger towns such as Pretoria, Johannesburg, and Potchefstroom: if such temporary exchanges could be effected none but the most beneficial results could accrue alike to the instructors themselves and to the teaching.

The exchanges suggested should also be extended between trades schools and manual training centres: no finer facilities exist anywhere for the training of finished tradesmen as teachers of technical subjects, at both the bench and the desk, than exist in the Johannesburg manual training centres, the Normal Training College there, and the South African School of Mines and Technology. The Training College would provide the courses in the theory of teaching, and the School of Mines the classes in technical subjects, while the trades school and the manual training centres provide the requisite " practising schools."

TRADES SCHOOLS.

The interest shown in trades schools has been well maintained. The South African Institution of Engineers appointed a sub-committee to consider and report upon both trades schools, and particularly upon their value in apprenticeship. The committee visited the Pretoria and Johannesburg Schools; they expect to complete a report early in 1914. The Pretoria Society of Agriculture and Industries provided special classes in trade subjects open to pupils in trades and industrial schools and in evening classes; these competitions carry silver and bronze medals in each class. The Witwatersrand Agricultural Society has also intimated that they will add similar classes to their show list for 1914. Extensive building alterations have been decided upon for the Pretoria Trades School and Polytechnic; these include provision for a double-storey building on the Church Street frontage, new workshops for the plumbing and blacksmithing trades, etc. These alterations are expected to be begun at once. When completed, the northern wood and iron building will be freed of all classes except those in science, and it is proposed to utilise the larger portion of this as a gymnasium for all pupils attending the institution. The new front building will supersede the present unsightly wood and iron one, which detracts considerably from the dignity of the institution and of Pretoria. Plans are in preparation by the Public Works Department. At the Johannesburg Trades School certain additions, to provide increased workshop accommodation, are in contemplation; these will consist of new workshops for the woodworking and blacksmithing trades, and at the same time the plumbers' workshop will be practically tripled in floor space. It is a matter for regret that the wages system already formulated in lieu of bursary grants to pupils cannot be brought into operation in the first term of 1914. It is also a matter for regret that no systematic advertising of the advantages of trades schools has yet been effected.

A code for elementary technical education is necessary; one giving full syllabuses in subjects and upon which teachers can base their schemes of work is required; there is the greatest dissimilarity at present. The intention of the regulations governing education in continuation classes is that the teachers shall submit syllabuses of the work to be done; this is not satisfactory for many reasons, the most important of these being the want of correlation which usually exists between the work of the primary standards and its application in elementary technical education. Again, teachers have perforce to be content with a mere skeleton outline owing to the usually meagre previous attainment of their pupils; otherwise they would feel unable to depart from their original intentions when they found it necessary to do so. In addition to defining more exactly both the inferior and the superior limits of technical education given through the department's continuation classes, such a code would do much to minimise overlapping with the curricula of grant-in-aid and other institutions of a like nature working more or less independently. Another matter which the suggested code would cover would be the workshop course in each trade in both the day and the evening classes of trades schools; these workshop syllabuses should, before final adoption, receive the approval of a recognised master in each trade. In this connection the papers set for the final certificate examination for trades schools held in 1912 and 1913 may be taken as fixing the upper limit or standard of difficulty.

EVENING CONTINUATION CLASSES AT TRADES SCHOOLS.

The attendance and enrolment in evening classes at the Johannesburg Trades School have increased; at the Pretoria institution the reverse has to be recorded, the numbers having been practically halved as far as pupils are concerned. The larger portion of the pupils are railway apprentices, and to their defection is due the large falling off in enrolment. This has been undoubtedly caused by the new regulations for railway servants, published on the 31st December, 1912, which substituted the payment of class fees in place of the high bonus previously paid, the apprentices making satisfactory attendance at three evening classes a week. To this must be added the local ruling of the Mechanical Engineer, that the only classes he would recognise were those in the subjects of machine drawing and arithmetic. From 1914 all new pupils desiring to attend the Pretoria institution will be required to have reached a certain educational standard according to the trade classes or subjects which they desire to attend; pupils who have not the necessary qualifications may attend classes in primary school subjects, and for this purpose these classes have been concentrated at the Gymnasium School. The Pretoria Trades School and Polytechnic in this way becomes solely a secondary institution for technical education, which is a distinct advance.

Correspondence and Discussion.

Comments on Questions Arising in Technical Practice or Suggested by Articles in the Journal—Views, Suggestions and Experiences of Readers.

The Deluge of Rand Statistics.

To the Editor, *South African Mining Journal.*

Sir,—" Shareholder " is wrong, and his suggestion would drive away clients, whom we badly need. We have built up the Rand on our monthly records, and they must be maintained, even if they are against us at times. A few days' work monthly by a 40s. per week clerk is all that is needed, or else put the work out by contract and it could even be done at a lower rate than this. There is still room for a 10 per cent. reduction in costs. Shareholders insist upon *more, not less,* information being given them. It looks as if the mines are to gain no advantage from the wars unless we now insist and agitate.—Yours, etc.,

" VALUATOR."

"What's Wrong with Rand Scientific and Technical Societies?"

To the Editor, *South African Mining Journal.*

Sir,—Your very useful and timely article on the above subject describes the position very accurately, and as it is generally established that a *malaise* exists, as you say, then it is very necessary that the experts, the Presidents and Councillors of the various societies should be called upon to deal with the present state of affairs. Now as to the *real* cause of the trouble—I will tell you what is wrong. It must be regretfully admitted that the cause of the whole trouble is that if the *common* members dare to criticise the " President and Council," they are plainly snubbed. The fact is already well established, I am sorry to say, that if one wants to keep out of trouble the best thing to do is to take no part in the proceedings and lay low. One cannot be surprised at the want of interest of members, and all the silly excuses about members being absent " at the front " is not only untrue, but is calculated to deceive. My fellow chemists, metallurgists, geologists, engineers and mining men know what is wrong, but if they try to right the wrong, they fear they will be told " your services are no longer required," and they stay away like wise men. Until the present " self admiration " societies and councils are thoroughly swept clean, the end is certain—a most regrettable end—and that is death. The *malaise*, as you put it, is not in one, but is in all of the societies. The first thing is to recognise the disease, as you have done, and then to find a remedy. I am afraid there is nothing but an early demise, and then a renaissance, to remedy matters; at present everything is in a disgraceful mess.—Yours, etc.,

" NORTHUMBRIAN."

[Our correspondent's letter loses much of its value by overstatement and violence of language. Indeed, several passages have had to be deleted as libellous. Nevertheless, we print some of his remarks, as reflecting the views of some members of local societies.—*Ed.*]

MINING INSTITUTE.
TEACHING CENTRES:—{ JOHANNESBURG AND SCHOOL OF MINES, KIMBERLEY.

Prof. YATES prepares candidates for the following Government Certificates:—
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MINE OVERSEER'S. ELECTRICAL ENGINEER'S.
MINE SURVEYOR'S
by Class, Private Tuition, and Correspondence.
SOME 1914 RESULTS:—
MANAGERS - - - January and May - - - ALL Passed.
ELEC. ENGINEERS - February - - - - - 66% ,,
MECH. ENGINEERS- June (Kimberley Centre) - - ALL ,,
MINE OVERSEERS - - - - - - Practically ALL ,,
NEARLY 200 SUCCESSES. St. James' Mansions, Eloff Street.

South African National Union Activity.

DIRECTORY OF SOUTH AFRICAN MANUFACTURERS.

To the Editor, *South African Mining Journal.*

Sir,—Every week the English papers bring new evidence of the active steps Great Britain is taking to capture the export trade of Germany and Austria-Hungary. The offices of the Commercial Intelligence Branch of the Board of Trade have been thronged since the outbreak of war by manufacturers seeking information as to new lines of goods, which they hope now to be able to produce. In Australia a realisation of the opportunities for local enterprise was early grasped, and in Canada attention has been drawn to the fact that the country has been importing many classes of goods that it should be itself producing. The close of the war will undoubtedly find Canadian manufactures considerably increased in many directions. There is just the same opportunity for South Africa. In five years we paid Germany £16,000,000 for goods, some of which we might have made ourselves. Now is the time to actively develop existing industries, even if the creation of new ones may not at present be possible. The English Board of Trade is endeavouring to bring together merchants and manufacturers, so that the former will know what the latter can do to supply needs hitherto obtained elsewhere. That is what the S.A. National Union has in view in publishing a Directory of South African Manufacturers. It wants to get the names of every firm in South Africa manufacturing goods in commercial quantities. For the insignificant charge of 2s. 6d. each name will be inserted in a book, 5,000 copies of which will be distributed free all over South Africa. Such an advertisement is surely worth having! I, therefore, appeal to every manufacturer to send along the required particulars at the earliest possible moment. There is no sense in sitting still at this stage. We must be up and doing, and making ready for the day when the trade campaign, in which most parts of the Empire are engaged, will bring forth a rich reward for the people who have got there in time.—Yours, etc.,

H. E. KING,
Secretary, S.A. National Union.

P.O. Box 3823, Johannesburg.

[This letter is dealt with in our leading columns, wherein it is shown that local manufacturers seem united in a conspiracy of silence.—Ed.]

The Metallurgy of Gold and Silver.

Though some substantial improvements have been introduced during last year they are not of epoch making importance, but rather apply to details of working methods. The cyanide process still occupies the leading position among reduction methods. The most important improvement added to it last year was the use of aluminium dust as precipitating agent. The innovation acquires additional importance owing to the general applicability of its underlying principle—*i.e.,* the fact that aluminium does not combine with cyanide, and that after the elimination of the metals from the cyanide solution the cyanide can be used for further solutions. This points the way to a practical process by which ores containing soluble base metals might be profitably leached with cyanide. There are large quantities of complex ores containing so much copper that their gold and silver contents cannot under existing circumstances be treated with cyanide owing to excessive consumption of that expensive chemical. But if the cyanide used for dissolving these base metals can be reintroduced without appreciable loss into the solution the whole aspect of the matter is changed, and in order to extract the precious metals on a profitable basis it would only be required to find a method by which the several metals might be separately precipitated from the solution. Dr. Nagel, *Metall, und Erz,* from *Mining Journal.*

Rhodesian Section.

LATEST MINING NEWS.

Mayo (Rhodesia)—Rhodesia and Ashanti—Jumbo—Shashi and Macloustie—Tati Output—The Gaika's Mine Costs—Chamber of Mines' Report

The report of the Mayo (Rhodesia) Development Company, Ltd., for the year ended July 31 last states that, in addition to the claims, buildings, plant, etc., at the close of the financial year the company held £23,858 investments at cost, £125,434 shares and debentures in other companies at cost, and had £1,709 at bankers', and £7,812 on loan against securities. The loans from bankers and others owing by the company amounted to £26,760.

* * * *

The ordinary general meeting of shareholders in Rhodesia and Ashanti, Ltd., was held recently in London. Mr. D. J. Neame presided, and the report to June 30 last stated that a fresh tributing agreement on satisfactory terms came into operation last May. To August last, there had accrued to the company under the tributing agreement £152, representing 10 per cent. of the value of the gold and silver obtained. The report was adopted.

* * * *

The annual general meeting of the Shashi and Macloustie Exploration and Mining Company, Ltd., was held recently in London. Mr. Seymour Fort presided, and moved the adoption of the report to December 31 last, which stated that the British South Africa Company continued to provide the necessary amounts for the upkeep of the company's assets. The report was adopted.

* * * *

The report of the Jumbo Gold Mining Company, Ltd., for the year ended June 30 last states that 30 stamps and the cyanide and slimes plants have been working regularly. The average grade of ore fed into the mill was 7·47 dwts., compared with 8·42 last year. Value of gold won, approximately, was £50,218, and local costs were £44,309, the difference being £5,908, a decrease compared with last year of £10,776.

* * * *

The following is a return of the gold and silver produced in the Tati Territory during the month of October, 1914:—Somerset and Queen of Sheba Mines: Tributor, T. W. Angus: Mill ran 14 days 18 hours, crushing 132 tons, yielding 158 ozs. fine gold, 14 ozs. fine silver, value £655 10s. 9d. New Prospect Mine: Tributor, Estate T. H. Butler: Mill ran 15 days, crushing 271 tons, yielding 117 ozs. fine gold, 8 ozs. fine silver, value £480 14s. 6d. Cyanide: 615 tins treated, yielding 150 ozs. fine gold, 12 ozs. fine silver, value £531 10s. 5d. Lady Mary Mine: J. Marnoch: Mill ran 29 days, crushing 198 tons, yielding 231·43 ozs. fine gold, 72·60 ozs. fine silver, value £918 12s.

* * * *

At the Gaika mine the ore is crushed by five stamps and a Chilean mill, and during the company's financial year, which terminated on the 30th June last 36,928 tons were milled. The sands plant treated 17,241 tons and the slimes plant 19,371 tons. The total recovery amounted to 10·54 dwts. from a feed of 11·90 dwts. Working costs were as follows:—Development redemption, 5s. 6d. per ton; mining, 6s. 4·25d. per ton; milling, 5s. 4·98d. per ton; sands, 2s. 1·67d. per ton; slimes, 3s. 4·40d. per ton; general, 3s. 1·80d. per ton; total, 25s. 11·10d. per ton. The previous year's working costs totalled 28s. 6·73d. per ton. The chief reduction has been made under the heading of milling, which item in 1912-13 was 6s. 9·06d. per ton, as against 5s. 4·98d. during the past year. Owing to the extreme fineness of some of the slime derived from talcose rocks the filter presses were unable to handle the tonnage originally expected. Twelve months ago it was announced that this item was being duplicated, and it was confidently expected by thus increasing the tonnage treated to reduce the cost per ton. A larger tonnage of slimes was treated during the past year, but the average cost was only slightly less than before—namely, 3s. 4·4d. as against 3s. 6·9d. per ton. It is now officially stated that the slimes plant is working satisfactorily.

* * * *

The report of the Executive Committee of the Rhodesia Chamber of Mines for the month of October, 1914, states, *inter alia*:—The following is a summary of the returns of native labourers employed on Southern Rhodesian mines during the months of August and September, 1914:—Local, August 13,005, September 11,890; Portuguese Territory, August 6,587, September 6,519; N.W. Rhodesia, August 4,080, September 3,835; N.E. Rhodesia, August 5,562, September 5,721; Nyasaland, August 7,581, September 7,581; other sources, August 945, September 925; totals, August 37,760, September 36,471. The number employed in September shows an increase of 2,027 as compared with the same month of 1913. Mr. Clement Dixon, M.A.M.I.E., M.I.M.E., has been elected to a seat on the Executive Committee. Amongst the matters which received the attention of the Committee during the month were:—Price of raw gold; zinc supplies; unemployment in Rhodesia; and the general tendency for the price of stores to rise.

Companhia do Nyassa.

The report of the Companhia do Nyassa for 1913 shows a decrease under Customs revenue of £5.583, and an increase in hut tax of £15.137. In imports there was a decrease of £3.439, and in exports a decrease of £20,499. The total revenue of the territories for the period amounted to £78,104, an increase of £4,134, and the total expenditure to £66,729, an increase of £2,336. One of the chief causes of the decrease in Customs revenue was the poor agricultural results obtained.

Manicaland Output.

The mineral output of the Territory of the Companhia de Moçambique (Manicaland) for the month of October, 1914, is as follows:—Reef: Mill: Gold won (fine), 370 ozs. 8 dwts. 14 grs.; tons, 1,114; value, £1,515 6s. 9d. Concentrates (estimated): Gold (fine), 9 ozs. 0 dwts. 0 grs.; tons, 4·5; value, £37 16s. 0d. Cyanide: Gold recovered (fine), 13 ozs. 10 dwts. 0 grs.; tons, 385; value, £55 4s. 0d. Alluvial (estimated): Gold recovered (fine), 397 ozs. 0 dwts. 0 grs.; cubic metres treated, 50,007; value, £1,625.

Specimen copies of the *South African Mining Journal* can be had from our Agents, The Argus Printing and Publishing Co., Ltd., Byron House, 82-85, Fleet Street, London, E.C.

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10 Feet Lane Mill, inclusive spare parts, equal to Twenty 1,050 lb Stamps or Ten Stamps and Tube Mill: five month's work only, good as new; selling cheap.

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P.O. Box 2154, Johannesburg.

RECORD RHODESIAN GOLD PRODUCTION IN DETAIL.

Official Returns of Gold and Mineral Output from Southern Rhodesia for the Month of October, 1914.

We have received for publication from the office of the Rhodesia Chamber of Mines (Incorporated) the following detailed statement of the mineral output for the month of October, 1914, with comparisons and values:—

MATABELELAND.

	No. of Stamps.	Tons Treated.	Yield. ozs.	Value. £
Bulawayo District—				
Abercorn (W. J. Lane)	(5)	165	65·42	268
Do. (sands)	—	288	14·56	60
Antenior (W. J. Lane)	5	234	54·57	223
Antelope G.M. (Rhod.), Ltd.	2B 2P 1T	3,377	872·34	3,616
Do. (slimes)	—	3,039	920·24	3,815
Asherie (Triggs & Huntley)	5	215	149·69	612
Basch (Morrison & Granger)	5	245	81·95	335
Bassick (Bassick M. Syndicate)	5	108	67·07	274
Bobs (F. W. Spencer)	1C	500	93·19	381
Borrow (W. H. Robinson)	2	140	21·15	87
Bucks Reef G.M., Ltd. (J. Black)	5	861	250·64	1,033
Do. (sands)	—	613	39·90	163
Bulawayo Main A. (R. Aserman)	4	157	66·04	273
Bushtick Mines, Ltd.	28 2T	5,050	388·11	1,596
Do. (sands)	—	2,678	457·63	1,897
Do. (slimes)	-	2,169	94·69	393
"C." (D. and C. Syndicate)	10 1C	1,426	68·39	280
Do. (sands)	—	1,194	108·57	444
Do. (slimes)	—	232	33·21	136
Claremont (B. L. Whyte)	10	900	35·37	145
Do. (sands)		120	11·39	47
Carry (S. and G. Syndicate)	1 H	175	211·59	866
Clean Up (A. H. Scott), sands	—	950	64·98	269
Colleen Bawn (Colleen Bawn Synd.)	6 2P	950	72·52	297
Do. (sands)	—	400	67·01	274
Do. (slimes)	—	550	161·58	661
Cottage (E. R. Napper), September	1	45	30·43	126
Do. (sands)	—	100	10·27	43
Dobie (Carson Mines, Ltd.)	5	420	351·64	1,458
Eagle A. (Macdonald & Co.)	10	918	214·84	888
Do. (sands)	—	297	21·15	86
Elumba A. (Cooper & Bosomworth)	5	650	215·81	883
Do. (sands)	—	320	93·55	383
Emva (A. D. Hall)	5	72	18·81	78
Farvic (H. S. Henderson)	5	654	180·25	737
Do. (sands)	—	396	22·11	90
Flora (E. E. Beecroft)	5	705	125·35	513
Fred. (Transvaal & Rhod. Est., Ld.)	10 2P	2,050	1,156·31	4,754
Do. (sands)	—	2,050	328·07	1,342
Formby (Baldwin & Nield)	3	150	63·50	260
Godwin (Barrett & Stacey)	5	108	75·91	311
Do. (sands)	—	76	15·73	64
Golden Butterfly (Wheeler, Davis and Rintoul)	5 1P	423	163·32	668
Do. (concentrates)	—	3	3·47	14
Halley's Comet (Stevenson & Kerr)	5	20	7·00	29
Hope 2 (R. Dodman)	3	52	14·28	58
Intabanenda (Intabanenda Synd.)	5	283	89·87	373
Do. (sands)	—	250	27·03	112
Jumpers (J. P. McCay)	5	560	292·32	1,196
Do. (sands)	—	300	52·04	213
Kameel (Yellow Jacket Synd.)	5	350	89·53	366
Do. (sands)	—	1,080	54·00	221
Lone Hand (Armstrong, Furber and Alexander)	5	206	103·78	425
Do. (sands)	—	200		
Lonely Reef G M. Co., Ltd.	20 3T	4,030	694·25	2,840
Do. (slimes)	—	4,030	1,952·49	7,987
Long John (Susanna Mines, Ltd.)	13	2,164	115·48	476
Do. (sands)	—	1,897	224·33	922
Mamba (Johnson, Fletcher & Wood)	5	120	86·01	357
Marne (L. Zolta)	2	20	14·56	60
Matabele 3 (Criterion G.M., Ltd.)	10	724	206·91	846
Do. (sands)	—	420	43·14	177
Matabele Queen's Co., Ltd.	10	1,780	408·49	1,671
Do. (sands)	—	1,780	492·67	2 016
Do. (slimes)	—	581	65·36	267
Master Cecil (Master Cecil Synd.)	3	40	10·02	42
Mayfair (Arbery & Hicks)	5	690	195·06	798
Do. (sands)	—	396	118·90	486
Morven (C. A. Stevenson)	(5)	220	22·88	95
Nathan (N. Edwards)	5	21	14·41	59
Nelly (F. D. Roscoe)	3H	600	446·71	1,852
New Eclipse (J. R. Stewart)	5	554	188·69	772
Do. (sands)	—	310	40·50	166
Nicholson (H. Venning), sands	—	2,012	91·56	368
Northern Star (N. Star Synd.)	10	357	144·49	599
Do. (sands)	—	240	20·77	86
Old Nic (Chart. and Gen. E. and F. Co., Ltd.)	15 4P	2,764	1,012·35	4,141
Do. (sands)	—	1,437	237·42	971
Peach A. (Peach Syndicate, sands)	—	244	45·49	186
Penzance	2	132	20·87	85
Do. (sands)	—	61	64·77	267
Planet (Triggs & Huntley), sands	—	384	62·68	256
Pot Luck A. (T. Berwitz)	2	60	12·90	53
Princess (C. A. Abbott), sands	—	256	9·04	37
Roan (Robinson & Berwitz)	4	350	65·58	272
Rubble (J. Gilpin)	5	500	85·37	349
St. Serf (J. Cook)	3	50	13·39	55
Sara (Jubber & Guest)	2	200	15·59	64
Do. (sands)	—	350	21·31	87
Star (Romola Nigel G.M. Co., Ltd.)	5	252	127·02	520
Do. (sands)	—	120	35·29	144
Sun Yat (J. Cook)	(3)	50	9·28	38
Teutonic (Macdonald & Bonshor)	5	230	243·56	996
Tuff Nut (King's Syndicate)	5	65	33·08	135
Umvoti (Henderson & Toshack)	2	76	43·31	177
Do. (sands)	—	240	11·11	45
Winifred (Exchange Synd.)	5	417	176·55	732
Do. (sands)	—	190	24·28	99
Wolley Dog (P. H. Davis)	2	75	78·49	323
Bulawayo district total			16,338·57	67,110
Gwelo District—				
Alderman (Williams & Woodger)	3	300	176·80	723
Ardpatrick (J. Maleham)	3	225	93·39	387
Bedad (A. and B. Syndicate)	5	300	71·44	294
Bee (Bee Syndicate), clean up	—	—	75·37	317
Bell Reef Dev. Co., Ltd.	2B 1T	3,200	1,783·40	7,393
Bonsor B325 (Cornish Syndicate)	5	500	109·08	446
Do. (sands)	-	770	69·24	283
Bonsor E323 (T. Roberts)	10	850	88·02	360
Cactus (Renton & Gray)	5	260	64·04	262
Do. (sands)	—	238	49·82	204
Camelia (S. Levin), sands	—	500	54·71	224
Cinderella (P. Burt)	1E	225	14·91	61
Cissy (G. Nicholson)	1H	350	82·67	338
Collingwood (Pini & Wearing)	5	400	140·72	583
Csardas (Wolfshall Syndicate)	10	666	565·12	2,343
Do. (sands)		480	91·40	379
Do. (slimes)	—	186	26·22	109
Dream (Dream Tributing Synd.)	3	300	203·95	834
Dunraven (New Dunraven G.M.)	5	800	116·95	485
Do. (sands)	—	700	47·09	195
Eileen (M. L. Price)	5	420	48·54	201
Falcon Mines, Ltd.	12 1T	8,506	3 811·69	16,047
Do., value under declared Aug.				148
Do., copper, £14,349.				
Gaika G.M. Co., Ltd.	5 1C	3,000	1,586·20	6,662
Do. (sands)	—	1,295	53·46	225
Do. (slimes)	—	1,742	139·74	587
Glen Rosa I. (D. H. Currie)	5	550	1,154·92	4,788
Do. (sands)	—	350	293·65	1,217
Globe & Phoenix G.M. Co., Ltd.	40 10P	6,014	6,828·68	28,680
Do. (sands)		2,695	1,990·98	8,362
Do. (slimes)	--	1,646	650·51	2,732
Do. (concentrates)	—	266	491·59	2 065
Do. (slags)	--	—	349·03	1,466
Gothic and Pagamesi (Mashonaland Agency, Ltd.)	15 2P	970	286·51	1,172
Do. (sands)		770	234·99	961
Invulnerable (W. H. Steele)	5	80	45·37	186
Do. (sands)		100	18·95	77
Kaka Main (J. Austen)	5	167	42·02	172
Kings (P. S. Warden), slimes	—	135	46·59	191
Little Blossom (J. Hazlehurst)	2	80	48·09	199
Meg (J. M. Havnar)	2	262	32·72	134
Moss (W. M. James)	4	720	347·25	1,439
Do. (sands)	—	480	35·64	148
Nil Desperandum (J. Waterworth)	3	30	12·91	53
Paradox (J. T. Woods), sands		-	14·15	59
Pompei (Bolt & Franks)	5	300	102·23	418
Do. (sands)	—	300	31·09	127
Pondo (F. C. Luxat)	5	600	208·85	860
Redhill Development Co., Ltd.	1 C	4,101	33·00	135
Do. (sands)	—	1,550	94·87	388
Shamrock (Crampin & Masters)	10	1,000	128·61	528
Snowed Up (A. E. Begbie)	5	166	82·30	341
Somerset (D. J. Laing)	2	310	127·39	523
Do. (sands)	—	260	51·76	212
Tebekwe 1 (A. N. Tyrell)	15	1,502	263·00	1,076
Tebekwe B 81 (A. N. Tyrrell)	15	590	171·69	702
Do. (sands)	—	1,560	111·67	457
Tinker (A. Malcolm)	5	234	28·50	117

	No. of Stamps.	Tons Treated.	Yield. ozs.	Value. £
Trixie (S. Levin)	10	557	85·13	348
Twin Nugget (T. Cannell)	1 C	63	13·40	56
Wanderer (Selukwe) G.M., Ltd.	4GR	12,160	1,482·91	6,066
Yankee Doodle (Bruhns & Schwarz)	10	1,405	246·21	1,007
Do. (sands)	—	930	112·11	459
Zabonkwe (Holmes & Urquhart)	5	450	33·84	139
Gwelo district total			25,897·08	108,150

Mashonaland total ... 42,235·65 ozs.
Value ... £175,260

MASHONALAND.

	No. of Stamps.	Tons Treated.	Yield. ozs.	Value. £
Hartley District—				
Acorn Gold Mines, Ltd.	5	163	23·02	94
Do. (sands)	—	280	57·75	236
Agnes (P. S. Triggs)	5	520	138·44	574
Do. (sands)	—	300	14·48	60
Aisleby (A. E. Watkins), pannings	—	—	2·37	10
Banshee (P. S. Triggs)	2	40	19·27	79
Beroche A. (H. Moser)	5	464	170·46	697
Brilliant (Mabel's Luck Synd.)	5 1P	909	408·61	1,671
Do. (sands and slimes)		546	84·90	347
Brompton (R. R. Aitken)	5	460	78·55	321
Do. (sands)	—	300	37·40	153
Cam and Motor G.M. Co., Ltd.	Roasting	12,435	4,035·14	17,109
Chadshunt (C. H. Wheildon)	5	277	161·53	661
Do. (sands)	—	204	43·17	177
Concession and W. Ext. (C. E. Simpson)	1C 2P	2,443	388·74	1,590
Do. (sands)	—	1,420	74·71	306
Cheshire Cat (Arnold & Windley)	5 1P	339	142·05	581
Do. (sands and slimes)	—	420	36·64	151
Coquet	5	100	9·75	40
Crown II. (Crown Syndicate)	2	120	26·21	107
Do. (sands)	—	50	5·85	24
Dalny (Macdonald & Sale)	5	924	67·72	277
Do. (sands)	—	470	174·18	713
Dalny 1 W. (Shagari Mines, Ltd.)	5	650	64·38	263
Do. (sands)	—	390	39·21	161
Eiffel Blue (Willoughby's Con. Co., Ltd.)	10	1,350	596·61	2.441
Do. (sands)	—	836	37·44	153
Eileen Alannah Mining Co., Ltd.	10	1,835	590·14	2,414
Do. (sands)	—	1,959	313·18	1.281
Enney Ext. (Ellsmoor & Goodyer)	5	480	146·41	599
Do. (sands)	—	620	38·86	160
Giant Mines of Rhodesia, Ltd.	30 2T	6,000	1,035·40	4,392
Glasgow Mines, Ltd.	5	654	141·10	577
Do. (sands)	—	300	49·73	203
Glencairn (Glenrosa Mines)	5	700	341·55	1,407
Golden Valley (J. Mack), Sept.	10	1,184	954·82	3.958
Do. (sands)	—	595	145·48	603
Do. (October)	10	1,267	794·58	3,294
Do. (sands)	—	665	164·98	684
Greta (G. C. Hooper)	3	29	5·01	20
Do. (sands)	—	59	8·62	35
Guelph (J. & M. Davidson)	3	125	43·83	179
Hepworth (L. Heilman)	2	183	28·93	118
Hilda (F. K. Keegan), pannings	—	—	13·01	54
Horse Shoe (V. L. Synd.), sands	—	670	40·39	165
Inez (Harrill & Smith)	10	1.010	262·28	1,073
Do. (sands)	—	613	90·90	372
Jackie's Luck (S. Smith)	5	20	11·36	46
Kanyemba (Kanyemba Synd.)	5	560	597·61	2,445
Do. (sands)	—	270	56·28	230
Lemberg (A. D. Bentley)	2	250	47·65	195
Midwinter	4	401	56·68	272
Do. (sands)	—	300	17·37	71
Mons (R. R. Aitken)	(5)	156	137·47	562
Mudale (E. A. McDowell)	2	180	103·48	423
Mystic (M. Price)	—	312	17·63	72
Do. (sands)	—	218	11·00	45
Oleander G.M. Co., Ltd. (Sept.)	3	300	74·60	309
Do. (sands)	—	500	32·70	136
Do. (October)	3	400	75·75	310
Do. (sands)	—	300	34·98	143
Owl (A. Rolfe)	10	1,622	803·05	3,285
Do. (sands)	—	1,485	367·54	1,504
Pickstone Gold Mines, Ltd.	10 1C	1,895	90·50	375
Do. (sands)	—	935	94·76	393
Do. (slimes)	—	915	246·47	1,008
Pomposo (J. Knott)	5	110	43·09	176
Reward (Mrs. Smith)	(5)	15	3·83	16
Shepherds (Phœnician (Rhod.) Co., Ltd.)	5 1T	988	235·67	964
Do. (sands)		1,038	93·47	382
Seigneury (Arnold & Windley)	5	421	215·27	885
Do. (sands)	—	300	20·49	84
St. George 1 (Hussey & Fraser), pannings	—	—	20·08	82
St. Louis (L. Heard)	2	60	92·13	382
Thistle Etna G.M., Ltd.	1C	2,132	700·31	2,872
Do. (sands)		1 570	92·94	381
Trinity (G. C. Hooper)	(3)	87	50·78	208
Do. (sands)	—	96	5·13	22
Village Main (Bruce & Buchanan)	5	155	66·92	274
Warthog (Durbar Synd.), July	5	70	9·82	42
Do. (sands)	—	70	9·23	38
Washington (I. J. Minnaar)	5	500	90·03	368
Do. (sands)	—	380	31·32	128
Hartley district total			16 815·13	69,713
Lomagundi District.—				
Alluvial (G. Blacklaws)	—	—	42·03	174
Do. (A. Coleman)	—	—	12·39	51
Do. (W. Kelly)	—	—	3·20	13
Do. (F. Needham)	—	—	17·87	74
Do. (A. G. Deane)	—	—	12·28	51
Do. (A. Smith)	—	—	9·48	39
Anvil (R. W. Stone)	2	109	52·65	215
Eldorado Banket G.M. Co., Ltd.	15 2C 4P	5,228	1,940·06	8,149
Do. (sands)	—	4,887	601·26	2,525
Do. (reserve)	—		100·00	424
Golden Kopje Prop. Mines, Ltd.	40 3T	7,923	1,408·90	5,918
Lone Hill (E. A. Day)	2	68	35·91	149
N.G.F. Main W. Ex. (F. L. Standen)	2	149	45·22	186
New Celtic (Howard & Southey)	2	206	31·69	130
Lomagundi district total			4.312·95	18,098
Mazoe District.—				
Alligator (R. Athey)	6	30	10·08	41
Botha H. (Cunningham & Allison)	5	1,800	86·71	355
Do. (sands)	—	840	81·40	333
Day Dawn	2	250	152·64	629
Do. (sands)	—	98	45·25	185
Jumbo G.M. Co., Ltd.	30	2,260	410·62	1,745
Do. (sands)	—	1.430	142·58	606
Do. (slimes)	—	830	40·52	172
Kimberley (Mash.) G.M. Co., Ltd.	8 2T	5,000	1,053·39	4,329
Do. (sands)	—	1,750	298·97	1.239
Do. (slimes)	—	3,250	340·06	1,410
Plum (Harries & Cook), clean up	—	—	17·90	74
Pompey A. (A. S. Warwick)	5	513	40·27	167
Puff Adder (Puff Adder Synd.), sands	—	548	51·52	213
Rand (Mickey Syndicate)	2	543	250·66	1,033
Ravine (H. O. Coker)	2	216	31·25	128
Rosary (R. Ricardo)	1 D	11	11·66	48
Shasi (C. Laland)	1 D	4	16·80	69
S.D.C. 3 E. (B. Byerley)	2	276	68·41	280
Tat (Oceola G.M. Co., Ltd.)	5	578	165·16	680
Do. (sands)	—	366	28·62	117
Venus (Giles & Southey)	2	194	74·20	304
Mazoe district total			3,418·67	14,157
Salisbury District.—				
Arcturus (L. Chiappini), sands	—	750	104·89	429
Ceylon (Monarch (Tati) G.M. Syd.)	5 1P	1,048	183·94	753
Do. (sands)	—	1,048	236·99	969
Crown 1 S.W. (Diggers' Synd.)	2	105	82·62	338
Found A. (O. W. Kelly)	2	167	105·93	433
Joker (Harrison & Drabble)	2	179	67·04	274
Louise Grand (H. S. Plant)	1H	1,204	59·93	245
Do. (sands)	—	1.158	78·03	319
Mont d'Or (Claxton & Bussell)	2	84	112·75	461
Mullingar (J. H. Hall)	2	263	69·76	285
New Agnes 2 E. (Fungwe D. Synd.)	5	487	95·71	392
New Full Back	2	89	23·04	94
Old Loyalty (Shamva Ilex G.M. Co., Ltd.)	5	547	194·74	797
Do. (sands)	—	548	49·40	202
Radnor (Lon. and Rhod. M. and L. Co.)	5 2P	1,000	692·23	2 832
Shamva Mines, Ltd	56 8T	48,489	3,005·17	12.622
Do. (sands)	—	19.393	1,772·71	7,445
Do. (slimes)	—	29.510	2 659·08	11.169
Zidonian (J. Wilson)	1H	95	26·90	112
Salisbury district total			9,620·86	40.171
Umtali District.—				
Arthur (F. R. Myburgh)	5	50	7·45	30
Cairndhu (E. K. Evans), sands	—	200	21·82	89
Champion (J. Buchanan)	5	660	102·89	421
Do. (sands and slimes)	—	360	101·45	415
Fairview 3 W. (Branken and Markham)	5	140	82·59	338
Golden Frog (S. W. Roberts)	1C	100	14·40	59
Golden Quarry (Steyn & Pollock)	5	350	61·65	264
Inca (F. Young)	3	240	64·06	262
Kent (Kent Mines, Ltd.)	10	710	203·84	834
Do. (sands)	—	580	40·65	166
Liverpool (R. G. Snodgrass)	5	228	71·53	293
Montezuma No. 2 (Montezuma G.M. Co., Ltd.)	10	1,000	226·67	932
Pilgrim 2 E. (O. R. Cawood)	10	900	85·25	349
Quagga (Thompson & Kapnek)	5	314	49·29	202

	No. of Stamps.	Tons Treated.	Yield. ozs.	Value. £
Rezende Mines, Ltd.	105	15,100	1,676·23	7,112
Do. (sands)		2,326	256·67	1,089
Do. (slimes)	—	1.050	99·26	421
Do. (concentrates)	—	151	488·21	2,045
Two Sisters (F. E. Simmonds)	2	22	7·66	31
Umtali district total			3,594·57	15,352
VICTORIA DISTRICT—				
Empress (S.A. Prospecting and Concession Synd., Ltd.)	8	1,360	214·82	879
Do. (sands)	—	1,300	119·82	490
Reinhold (R. R. Schielke)	5	270	36·74	152
Texas (G. Scott)	10	1,614	586·43	2,399
Do. (sands)	—	725	139·38	570
Victoria district total			1,097·19	4,490

Mashonaland total	38,929·37 ozs.
Value	£161,981
Total gold production	81,165·02 ozs.
Value	£337 241

SUMMARY OF PRODUCTION.

		Value.
Gold, ounces	81,165·02	£337,241
Silver, ounces	19,131·10	1,720
Lead, tons (Rezende Mines, Ltd.)	13·00	209
Copper, tons (Falcon Mines, Ltd.)	286·99	14,349
Coal, tons, sales (Wankie Colliery Co., Ltd.)	28,427 00	8,684
Diamonds, carats (S.A. Option Synd., Ltd.)	51·5	219
Grand total value of production,		£362,422

The Employers' Parliamentary Association.

At a recent meeting of the Central Executive Committee of the Employers' Parliamentary Association the two following resolutions were carried unanimously: —"That in the opinion of this meeting a further proclamation on 'Trading with the Enemy' should be issued, and that the expression 'enemy' should be so extended as to embrace any German or Austrian, or group of Germans or Austrians, resident in Great Britain or any other country, and any incorporated concern registered in Great Britain, or any other country whose capital, management or interests are wholly or preponderatingly under German or Austrian influence, or where the issued capital in such incorporated concern to the extent of one third is held by Germans or Austrians, irrespective of whether such Germans or Austrians or the concerns in which they are interested are manufacturing in Great Britain or in any other country (or whether they are not manufacturers), and irrespective of whether the parties concerned have taken out papers of naturalisation in Great Britain or in any other country unless such parties can show that their act of naturalisation was prompted by motives which are not detrimental to British interests. The status of the parties concerned shall be determined by their actual status on June 1, 1914, and no transfer of shares, reconstruction of boards of managements, changing of names or handing over of business which may have taken place since that date shall be recognised as affecting this definition." Also "That such further Proclamation, as here advocated, should provide for a 'licence to trade' being granted by the 'enemy' provided that this licence shall be granted only on the understanding that the 'enemy' business is placed in the hands of a receiver appointed by the High Court under the provisions of Clause 3 of the 'Trading with the Enemy' Act, 1914, except that such procedure shall not be necessary for small firms whose business are self-contained and are not and have never been branches of a parent concern in an enemy country; and in no case shall a licence be granted to an 'enemy' in this country merely agenting the products of enemy countries." The Committee were strongly of opinion that half-hearted measures were, under existing circumstances, productive of much dislocation to trade in general.

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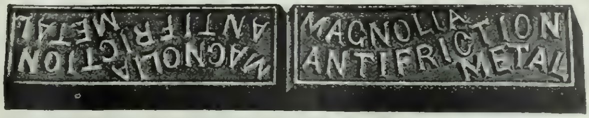

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Engineering Notes and News.

The Training of Engineers.

During last month there was issued to members of the Institution of Civil Engineers the report of a Committee appointed after the 1911 Conference to consider questions connected with the training, as distinguished from the education, of engineers. Prof. Unwin was chairman of this committee, and the other members are men well known in the profession. The committee made its report after long correspondence and after five small conferences had been held. This report was brought before the Council on July 7th and adopted. Its recommendations, which we may presume have been or will be acted on by the Institution, and which have an obvious value in this country, are that (1) Engineers who are taking young men for training should, where no regular indentures are given, sign an agreement at the beginning of the term stating that opportunities "substantially equivalent" to those usually enjoyed by apprentices shall be given; and (2) that when a young man has completed his training the engineer with whom he has worked shall mark on a printed schedule the subjects in which he has had opportunities of getting experience. Furthermore, engineers are to be requested in future to inform some agency, equivalent to the Appointments Board, when they have vacancies and what are their terms, and are invited to give preference to young men who have passed examinations which exempt them from the Associate Membership Examination. The present recommendations are not generally applicable; they affect members and would-be members of the Institution only.

Union Purchases of Rolling Stock.

An order for 20,000 tons of steel rails for railway construction in South Africa has been placed with Messrs. Guest, Keen & Nettlefolds, of Dowlais, South Wales. Mr. W. S. Sim, advisory engineer to the Union, is cited as stating that the Government are contemplating an order for steel coaches for both suburban and main line work. These coaches are to be of the latest American pattern, and built entirely of steel, whereas most of the coaches on the South African railways in the past have been made of teak.

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Water Board Vaal River Scheme: Reservoir Leakage.

Early in the month of July last a rumour gained some currency that the loss of water caused by leakage in the bed of that section of the Vaal River affected by the Board's proposed reservoir, was likely to be so great as to endanger the practicability of the Board's new scheme from that point of view. The Acting Chief Engineer has carefully examined the banks of the Vaal River, and those of the four tributary streams entering the Vaal beween Engelbrecht's and the barrage site, with the object of ascertaining, as far as possible, whether, when the reservoir is full, any excessive leakage is likely to occur over the increased area flooded. He is satisfied from his investigations, and also from certain tests carried out by means of trial pits sunk in the coal measures and the coal measure sand stones, that no appreciable leakage is ever likely to occur in these formations. The final conclusion arrived at is, that there is no undue leakage in the river bed under present conditions, and that so far as the additional area to be flooded is concerned, only the natural absorption due to the submersion of dry ground need be expected. This, therefore, disposes once and for all, of the suspicions entertained concerning the Vaal River Scheme, from the point of view of excessive leakage along the reservoir area. As the Supplementary Water Supply Act passed at the last Session of the Union Parliament requires the construction of certain weirs along the reservoir area, and on the streams flowing into the Vaal River along that area, the Board-in-Committee authorised the immediate construction of two of these, one at Engelbrecht's Drift and the other near Lindeque Drift; these are now completed. The weirs required upon the tributaries are not so important at present, and their construction will be proceeded with as opportunity offers. The erection of these weirs will enable the Board to have in its possession data with reference to the river flow for two seasons earlier than would otherwise have been the case. These data will be very useful when the time comes for the Extraordinary Water Court now being constituted to determine the normal flow of the Vaal River, and to exercise the other important powers and functions which have been conferred upon this Court by Parliament.

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ELECTRIFICATION OF RAILWAYS IN SOUTH AFRICA.

Important Discussion on Prof. Buchanan's Paper—Views of the S.A.R. Electrical Engineer—Author's Reply.

THE discussion on Professor Buchanan's paper on "Electrification of Railways" was brought to a close at the meeting last month of the South African Institute of Electrical Engineers in the following proceedings:—

The President: Before calling on Prof. Buchanan to reply to the discussion on his paper, I have great pleasrue in extending a hearty welcome to Mr. Mills, Electrical Engineer to the South African Railways. I understand he proposes to say a few words on this paper. As you are aware, gentlemen, the subject of the electrification of railways is dealt with by Mr. Hoy, the General Manager of the South African Rialways, in his report of last year. He thinks the time is now ripe for a report to be made on this matter dealing with South Africa generally, and, as it is a very important matter, I hope some result will come of it for the benefit of engineering generally. Prof. Buchanan is to be congratulated on having brought forward this question. I was to have contributed to the paper, but, unfortunately, I have not been able to find the time. My intention had been to touch on that very much wider application of electricity: the supply of electrical power hand-in-hand with the electrification of railways throughout the country. I can safely predict that this side of the question will also have to be considered when electrification is being discussed. I feel certain that the linking up of the water powers now running to waste will assist in this greater scheme—the supply of cheap power for railways, irrigation, manufactures, and every other expansion in this country; this is possible now as we know, for the way electrical supply has recently increased is an assurance that this is the direction of progress. I now have very much pleasure in calling on Mr. Mills.

Mr. F. W. Mills (Visitor): Mr. President and Gentlemen,—I have to thank you for your courtesy in allowing me to attend this meeting in the capacity of a visitor, but I trust that in the future I shall not again appear in that capacity, as I propose to offer myself for election as one of your members. Yesterday Prof. Buchanan asked me if I would make a few remarks in criticism of his valuable paper. As the time was so short and I had not seen the paper till a few minutes before he called upon me, I am afraid I can have little to say in that direction, as I have not had time to study it. I should like, however, with your permission, to tell you what has been done in the direction of enquiry into this important subject so far as the railways of this country are concerned. In 1903 a report was obtained by the General Manager of the late C.S.A.R. on the electrification of the "Randfontein to Springs Line," and it was so convincing that the electrification of the line was recommended, but owing to the difficulty in regard to finance it was finally dropped. This was before the days of the Victoria Falls Power Company, whose advent on the scene has altered the conditions somewhat. Given a fair price per unit by that company, there is now no reason why this important suggested work should not be successfully carried out to a conclusion. In 1908 a further scheme was placed before the General Manager. The cost of the electrification was estimated to be approximately £300,000, exclusive of generating station. In 1912 I reported to the General Manager upon the electrification, and I figured that the cost would be some £261,000, and that we should recover the use of 24 steam locomotives and 55 passenger vehicles of a total value of approximately £200,000. These vehicles could be used on other parts of the system, and their value was a fair credit to the electrification scheme. The electrification of the suburban lines at Capetown has also been considered and reports sent in. This is as far as we have gone, but I have no doubt that in the near future the electrification of certain sections of our line will become one of the live questions, as both Mr. Hoy and the Railway Board are keenly interested. You are all aware that the choice of system is a very important one, and much discussion has taken place between the advocates of single phase, alternating and direct current at 1,500 to 2,000 volts. The tendency at present seems to be in the direction of adopting direct current, as most of the later electrifications have been upon that system. The relative merits of the single phase and direct current systems (taking D.C. as 100) are strinkingly illustrated as follows: Cost of complete trains 100 D.C., 175 S.P.; weight, 100 D.C., 120 S.P.; maintenance of equipment, 100 D.C., 200 S.P. With our narrow gauge the weight and the space occupied by equipments is an important factor when settling this question of system. The above figures seem to be rather startling, but apparently they are correct, as the costs and tenders for the Melbourne electrification, involving 300 miles of track, were entirely in favour of the direct current system. It is interesting also to note that in the past few years in America no less than seven railways changed their system from single phase to direct current at 1,500 volts. Apart from this question of system, there is no doubt whatever that under certain conditions it will pay to electrify our railways, and Prof. Buchanan's paper on this subject is therefore very welcome, as it brings forward discussion and assists those of us who are fighting the older methods. With the assistance of the Victoria Falls Power Company, so ably directed by Mr. Price, I am sure that electrification is near at hand if only a low price for power can be obtained.

The President: We are greatly indebted to Mr. Mills for the information he has given us, because we feel now there is another step taken, and an important one, in connection with this question of electrification. I remember the hard-fought fight that took place when electrification was discussed for the mines, but that is an accomplished fact now. The electrification of the railways will be much easier in view of the success of electrification on the mines; it is only a matter of time, I hope a short time, when it will be an accomplished fact.

Prof. W. Buchanan (Vice-President): The reply to the discussion on my paper must be of a somewhat discursive character, for the contributions were mainly in the nature of supplying additional information, rather than advancing critical arguments against the views expressed. It was unfortunate that owing to the lateness of the hour at which the paper was read Mr. Robert Hammond was unabel to

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discuss it as fully as he wished, so the members lost the benefit of his great experience and the pleasure of listening to his most eloquent delivery. In his few remarks he clearly brought out the fact that modern electrification of the railways is but a natural economic evolution in the centralisation of power generation, which he and a few other engineers have been striving for during the past quarter of a century. I must just point out that in his reference to "the assumed cost of a penny per unit on page 278 reduced to 0·75d. on page 284," the actual values were assumed as sufficiently accurate for a comparison of the costs for the two contrasted electrical systems, the higher value being the cost of electric energy delivered at the train, while the latter is the price paid for three-phase energy supplied before conversion, the difference being thus due to the losses in converting machinery, feeders and line. I quite agree with Mr. E. V. Perrow that it would be a foolish policy for South Africa to wait for some universally perfect electrical system that may be evolved in the future; as pointed out in the paper, all practical systems have certain advantages in particular cases, and it rests with the responsible engineer to carefully consider their relative merits, and then decide upon that best suited for the given conditions. Mr. Perrow favours the direct current for railways, particularly when worked at "high voltage," which at the present day means anything from 1,500 volts upwards, and includes using two motors permanently connected in series. The mercury rectifier, to which he also draws attention, offers a way to avoid the disadvantages of the single phase motor, while retaining the benefits of a.c. distribution. He will be interested in a note which appeared in the *Electric Railway and Tramway Journal* of June 5th, which states that the Pennsylvania Railroad had a truck equipped with four 225 h.p. direct current motors, a "mercury rectifier," with a.c. control and transformer; the car was tested for some months at Pittsburg, and is running at the New Hanen Railway, which has 11,000 volt single phase trolley; it is not yet open to public inspection, but the experiment appears promising. The suggestion to use d.c. at, say, 1,500 volts for outlying districts and 500 volts for town service does not appeal to me; there is the complication and extra cost of having two different types of generating unit, and when passing from the lower to the higher voltage it would be difficult to avoid an unduly high rate of acceleration causing a very unpleasant jerk. The booster system of the Paris Metropolitan Railway is interesting, but the stops must be very frequent in order to show a saving of 20 per cent. in the consumption of energy. Some ten years ago I designed a booster on the Ward Leonard principle for the City and South London Railway. The method of operation was to start the train by low voltage from the generator, gradually increase the speed by raising the excitation in the usual way until half line pressure reached, when the generator was connected in series with the train motors, both taking about half full voltage; then the generator field was gradually weakened, reducing the pressure to zero, when the motors got full line voltage. By this arrangement the booster set is only half the capacity with about half the losses of the ordinary Ward Leonard motor generator. I quite agree with Mr. Perrow regarding the advantages obtainable by electrically-operated points and signals, but this special application of electricity hardly came within the scope of my paper. I consider that the thanks of the Institute are due to Mr. John Roberts for his valuable contribution to this discussion. He gives us much useful information, and brings to notice many interesting advantages of electrification not mentioned in the paper. It may be recollected that it was shown with a given quality of coal, steam locomites use at least twice the quantity required by electrics doing the same duty; but Mr. Roberts very rightly points out that a cheaper coal can be used by the latter, although I think that his claim for one fourth the cost is too favourable. In the report of the General Manager of the South African Railways for 1913 it appears that 1,895,349 tons of steam coal was purchased at a cost of £465,400, or an average of 4s. 11d. per ton. No doubt the actual cost delivered on the locomotive tender is much higher, and we should be safe in assuming that small coal would be obtainable delivered at a central power station at two thirds of the above price. If we further allow £65,400 as cost of coal used otherwise than in locomotives, the cost for an electric system would be £400,000 × ½ × ⅔ = £133,333, or the saving is two thirds of the present cost with steam. The saving in cost of water supply is also an important item to which he directs attention. In the above mentioned report it is stated that owing to drought great difficulty was experienced in maintaining the engine water supplies; total failure occurred at a number of points, so that water trains were run to provide for the ordinary service. Mr. Roberts expresses regret that the paper dealt with a line 60 miles long instead of with the South African Railways as a whole, but surely the electrification of the latter is not a present-day problem, while the investigation of the relative merits of D.C. and A.C. was made more definite by taking up a simple case. It is admitted that to determine the best electric system for any particular portion of a railway due consideration would have to be given to the effect upon the whole. It would be a great disadvantage to have different types of electrical equipments on various sections of one railway system. He says: "With A.C. we can use say 15,000, and if 15,000 why not 25,000 volt trolley wires." We may of course push this argument further—and if 25,000 why not 50,000 volts, etc. The voltage to be adopted in any scheme should be that giving a minimum cost as determined by a modified Kelvin's law; there is a minimum diameter of trolley wire determined by mechanical considerations, the I^2R energy loss diminishes with increase of voltage, while the cost of

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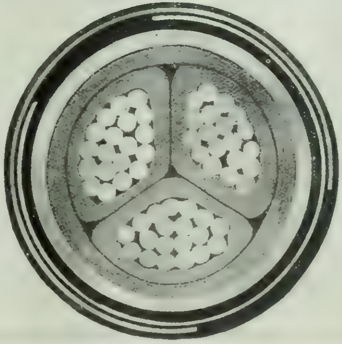

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insulators and transformers increases, so that obviously there is a best voltage for a given length of line, traffic density and cost of electric energy. Mr. Roberts's remarks upon the important subject of D.C. *versus* A.C. systems are very interesting. I regret that local representatives of manufacturing firms have not given us the benefit of the recent opinions of their railway engineers upon this vital question The final part of his contribution dealing with the standardisation of electrical systems, frequencies and voltages could readily form the basis of a new paper. He appears to have given this subject a great deal of thought, and I am glad to be able to endorse his opinion that it is within the proper sphere of our Institute to approach the Government with recommendations for securing uniformity of electric supplies, so far at least as railways are concerned. I am pleased to note that Mr. J. W. Kirkland is also in complete accord with Mr. Roberts's views regarding standardisation, but I doubt if it is now practicable for Government to become the universal power providers, unless perhaps of such power as is available from waterfalls, where it might be very difficult for a private company to claim the sole rights. Mr. Bernard Price makes some useful suggestions in his contribution to the discussion, and I am pleased to find that he is generally in agreement with the opinions expressed in the paper. Members should carefully note his main conclusions as—"railway electrification on a large scale . . . . has now become a matter of everyday engineering." and "each individual project should be considered on its merits, and should be attacked as its own particular conditions and difficulties demand." Mr. Price makes out a good case for any railway purchasing its electricity from existing companies in preference to erecting their own generating station; certainly if the supply mains of a large power company are within reach it ought to be possible to supply current at such a price per unit as to induce the railway to purchase. Consideration should be given to the increased safety against failure by reason of the great capacity of the company's plant in proportion to the maximum demand of the railway. I might point out that correction of power factor is obtainable in the conversion of three-phase just as with direct current, by using synchronous motors. In neither case, however, would the railway be justified in installing synchronous machines, demanding more time and skill to start and at somewhat higher cost than induction machines, unless the supply company quote a lower price for a leading than for a lagging current. In the paper I stated that the steam locomotive runs on the average 30,000 miles per annum. I regret that none of the mechanical engineers of the railway have criticised this figure and given the values obtained by modern engines. The report for 1913 previously referred to gives the total engine mileage, including shunting, as 38,933,000, while the number of locomotives is—neglecting a few narrow gauge—1,428, thus giving an average of 27,300 miles per engine per annum; obviously new engines will give a much better result than those that are of ancient type. Although railway electrification is a subject that does not at present appeal directly to the interests of our members, it is to be hoped that a start will soon be made in South Africa, where there are a number of sections of the Government railways that would show to great advantage by being electrified. I am authorised by Mr. W. W. Hoy to state that the subject is receiving careful consideration by the Railway Administration, and they have decided to appoint an expert to study the existing conditions and report upon (a) capital cost, (b) working expenditure, (c) choice of syetem, and (d) section of line to be electrified. Since this reply was written we have had the instructive and appreciative remarks of our President, and the contribution from Mr. Mills telling us that the railway management have given full consideration to various proposals that have been submitted for electrifying certain sections of the South African Railways. I regret to be unable to agree with Mr. Mills's figures for relative weights of D.C. and A.C. trains. Even if they refer to electrical equipments only, they are too favourable to D.C., particularly when high tension is considered with its motor generator to supply all auxiliaries. Mr. Mills possesses a lot of valuable data regarding electrification of railways, and has promised to give us a paper dealing with some of the more important feature of this subject. In concluding, I beg to thank the various contributors to the discussion for retaining our interest in a subject which I trust will soon become of greater importance in South Africa.

Commerce and Industries.

Whaling on the West African Coast.

The abundance of whales off the coast of southern Angola has caused the establishment of an industry of some importance at Mossamedes. The four pioneer companies have been increased to six, there being now, according to the United States of America Vice-Consul General Harry A. McBride, four Norwegian concerns, one British, and one Portuguese. Two of the Norwegian companies are located in Bahia dos Tigres, each operating a floating refinery, one is in Porto Alegre operating a floating refinery and also an establishment on land, and the fourth operates at Elephant Bay, south of Benguella. The English company is at Port Alegre and the Portuguese at Mossamedes. The total catch of the Angola companies during last year was estimated at 3,000 whales. The oil alone from such a catch would be worth over £200,000. The product has hitherto been sold at Glasgow and Hamburg, but a Norwegian syndicate has now made arrangements for purchasing the entire output. As a rule, the catch is comprised of the "humpback" variety, though a sperm whale is sometimes captured. The season extends from April to November. Regulations will probably soon be made by the Government to limit the catch, as, up to the present, no discrimination has been made between the full-grown whale and the calves, with the result that the number is rapidly diminishing. Up to 1911 whales were seen daily off the shore and in Lobito Bay, but this is now a rare occurrence.

* * * *

New Openings for S.A. Enterprise.

The disturbance in trade caused by the war in Europe is compelling consumers to look for new sources of supply, states the South African National Union. Enquiries have already been made as to whether this country cannot fill the gap in several instances. Several new openings for enterprise on the part of the South African farmer have recently been presented. For many years sunflower seed has been grown on a large scale in Russia, where the seeds are used for food, and for the manufacture of oil and feeding cake. Over £1,500,000 worth is annually exported to America and the United Kingdom. The Russian

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market having been cut off, attention has been drawn to South Africa as a possible source of supply. One firm in the United States offers to take shipments of 100 to 500 tons, if the price is satisfactory. This would seem a matter well worth consideration, for, as regards distance, we are very little farther off than Russia, and several parts of the Transvaal are said to be well suited to the production of this crop. The Broom Corn we require for broom-making has hitherto been imported chiefly from Austria-Hungary. With a present annual demand exceeding 50 tons, there is every encouragement to grow it here. It is claimed that the climatic conditions of this country are particularly favourable for the successful production of Broom Corn. In the growth of Castor and Soya beans there is also an excellent opportunity for enterprise. A consignment of the former, sent from Rhodesia a year or two back, was reported on most favourably. We have already proved the capabilities of South Africa for the production of wattle bark. There are difficulties in disposing of the bark in England, but wattle extract will be taken, and it should not be impossible to obtain the few thousand pounds required for the erection of a factory. In addition, we should be able to supply some of the oats, beans, peas, and potatoes hitherto obtained from Germany. The more one looks into the question, the greater seem the possibilities of agriculture in this country, when we consider the vast areas available and the extraordinary diversity of soil and climate—a diversity that makes possible the choice of a wide range of product—from oats in the south-western portions of the Cape to oil seeds in the Northern and Eastern Province of the Transvaal, with many other things in the intermediate district.

* * * *

A Promising Industry.

In Press Circular No. 16, issued by the Department of Agriculture, South Africa's opportunity to replace imports by exports is again dealt with by Mr. Arthur Little, Lecturer on Poultry, Grootfontein School of Agriculture, and Government Poultry Expert. *Inter alia*, he says: "South Africa has now, if she seize it at once, an opportunity that will never occur again, viz., of keeping annually £80,000 in the country, and in a short time capturing a like sum from overseas every year. This enormous benefit can be obtained by a larger production of eggs and poultry, sufficient for the needs of the population and for export, and a share of this large sum of money can be participated in by every farmer and poultry keeper, whether he keeps a large or small number of fowls." The main factors ensuring this benefit to the country as a whole and a large number of its population are set forth in the article, "Profit in Poultry," recently published by the same authority.

South African Fibres.

Professor W. R. Dunstan, C.M.G., in his report on the work of the Imperial Institute for 1913, just issued, states that during the year three samples of "Lukushi" fibre, prepared in different ways, were received from Barotseland, and when tested were found to be of good strength, but their length did not exceed 21 ins. "Fibre such as this," says the report, "would be worth about £20 per ton in the United Kingdom, but if obtainable 3 to 4 ft. long it would be equal in value to Mexican sisal," which at the date of the report was valued at £35 per ton. Referring to specimens of Sansevieria leaves and aloe fibre received from Bechuanaland, the report states that the former were identified at Kew at *Sansevieria rhodesiana*, and on extraction by hand at the Imperial Institute yielded a fibre of good strength from 3 to 4 ft. long, and similar in character on the whole to a good grade of sisal hemp. If obtainable in commercial quantity and from 3 ft. 6 ins. to 4 ft. in length the fibre would be readily saleable in the London market as a substitute for sisal. The aloe fibre, which was thought to be derived possibly from *Aloe Lugardiana*, was of very good appearance and mostly about 2 ft. 6 ins. long. It would probably be saleable in the United Kingdom as a cordage material, although the sample examined was rather short for this purpose; it was valued at £27 to £28 per ton in London.

Creosote for Preserving Timbers.

Experiments conducted in the United States show that creosote oils extracted from timber which has been in use many years have an average of 32·9 per cent. of distillate below 270 deg. C. and 66·8 of oils of high boiling point. The defects of most modern creosote preservatives are deficiency in basic oils of high boiling point and the substitution for these of tar or other viscous substances. Under proper conditions of distillation a stable, heavy creosote oil (sp. gr. 1·10) could be manufactured from coal tar, containing nothing which boils below 210 deg. C; for general purposes not more than 50 per cent. of the total should distil below 315 deg. C., and for wood-paving blocks not more than 35 per cent. The qualities demanded are penetrating power, stability and preservative and water-proofing value. All these are possessed in a high degree by pure heavy creosote oil. Tar has a very low penetrating power, even when injected at a high temperature, and wood treated with a mixture shows a separation of the components oil, tar and carbon, at the margins of the close-grain rings. As regards stability, losses occur owing to volatilisation, extraction by water and crystallisation in wood impregnated with light creosote oils. Preservative value may depend on direct antiseptic action or permanent adhesion of a stable oil-coating to the walls of the minutest cells; external filming without penetration is of little account. In the light oils the antiseptic constituents predominate, but are volatile and largely soluble in water. The heavy oils are sufficiently rich in the higher homologues of cresols, both these and the protective oils being far more stable. Waterproofing also depends on the complete coating of the cell walls with an oily deposit which excludes moisture.

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The Week's Company Meetings.

CONSOLIDATED MAIN REEF.

What the New Shaft Disclosed.

Mine Employes and the War.

The annual meeting of the Consolidated Main Reef Mines and Estate, Ltd., was held last week, the chairman, Mr. W. H. Dawe, presiding. Among those present were Messrs. R. Goldmann, J. H. Ryan, C. Meintjes, G. C. Fitzpatrick, A. G. Gill, A. A. Auret, P. Dreyfus, J. Jourdan, J. R. Nicholson, J. R. Lynch, W. P. Fisher, W. Rockey and A. Gregor, acting secretary, representing 260,383 shares out of the total of 924,364.

Chairman's Speech.

The Chairman said: Gentlemen,—The directors' report and the financial statements, accompanied by the reports of the consulting engineer and the general manager of your property, deal with the financial year which ended on the 30th of June last. In reviewing the results obtained during that period we have to take into consideration the fact that operations twice suffered from the disorganisation which was the outcome of the strikes which took place in July, 1913, and January last. One of the chief results arising out of the circumstances mentioned was the effect on the native labour supply; and in this connection it is sufficient to mention that whereas we had an average number of 1,872 natives employed underground during the year which ended the 30th of June, 1913, we had an average number of only 1,442 during the period under review. This difference was naturally reflected in the results obtained, both in regard to the profit earned and to the amount of development accomplished; but, having taken the fact into consideration, I am sure you will agree with me that the statements submitted to you are satisfactory.

Working Profit.

The working profit for the year amounted to £116,609, to which must be added the sum of £3,666, being the value of gold obtained, during June, from the final clean-up of certain plates which were not required in the new tube-mill plate-house, to which a portion of the battery plates had been transferred. These two items together give a total of £120,275. The decrease in the actual working profit, as compared with that of the previous year, was £22,806, while the decrease in the tonnage milled was 25,048 tons. In spite of this decrease, the profit allowed your directors to declare two dividends of 5 per cent. each—which is the same as the amount of dividends declared during the previous year—and carry forward a credit balance of £65,423, as against the credit balance of £58,659 on the 30th of June, 1913. Capital expenditure during the year amounted to £60,193, and of this amount £12,459 was chargeable against the year's profits. The remaining expenditure was met out of the funds provided by the amalgamation in 1909, as it represented a portion of the scheme of development then decided on; the balance of cash available for capital expenditure, from this source, on the 30th of June last was £40,120.

Restricted Labour Complement.

Turning to the mining operations, the restricted labour complement necessitated the use of a larger number of machines for stoping, the percentage of ore broken by machines being 60.6 per cent. for the past year, as against 45.8 per cent. for the year ended the 30th of June, 1913. Though the development work was smaller than it would have been under ordinary circumstances, it resulted in the exposure of 238,480 tons of ore, of an average value of 7.6 dwts. over an estimated stoping width of 48.4 inches, whereas the previous year we developed 185,050 tons, of an average value of 7.2 dwts. over 48 inches. The ore reserves, at the figure of 693,460 tons of an average assay value of 7.3 dwts. over 48.6 inches, show an increase of 78,990 tons, the value being practically the same, though the stoping width is a trifle greater. You will note that these figures show a steady improvement: and the same remark might be applied to the monthly tonnage crushed, as, in June, the last month of the financial year, the tonnage milled was over 24,000 tons, and since then that tonnage has been exceeded each month.

Development Operations.

From the consulting engineer's report you will gather that the chief point of interest was the development in the section of the property near the vertical shaft. The main reef leader was exposed in the west drives from that shaft, on the 21st, 22nd, 23rd and 24th levels; and whereas, at the date of the consulting engineer's report, 923 feet had been driven, of which 810 feet sampled gave an average assay value of 8.8 dwts. over a stoping width of 48 inches, on the 11th of November this footage had been increased to 2,263 feet, of which 2,125 feet were sampled, the average assay value obtained being 9.6 dwts. over 48 inches. In the east drives from the vertical shaft, 991 feet were driven, of which 505 feet were on the reef, and 486 feet in dyke and broken ground. Of the 505 feet sampled, 120 feet, on the 24th level, gave an average of 5.6 dwts. over stoping width, and 385 feet on the other levels gave unpayable values. Since the consulting engineer's report was written there has been no improvement in the values of the east drives. The main reef leader has been intersected on the 25th level; 35 feet driven in the west drive gave an average of 9.0 dwts., and 35 feet in the east drive an average of 11.0 dwts., both these values being over a stoping width of 48 inches. The assay values obtained in the western drives from the vertical section are extremely satisfactory; the most recent developments show considerably higher values than the average given, and you will notice that the values obtained on the 25th level, which is about 2,700 feet vertical depth from the surface, average 10 dwts. over 48 inches. This result, obtained as it is from the lowest point in the mine, must be regarded as very encouraging. Your consulting engineer points out that the distance of the vertical shaft from the western boundary is about 3,600 feet, and he considers that the results so far obtained indicate the probability that a large percentage of this western area will contain payable ore, while the outlook for the east side is disappointing, as it has been for a long time past.

South Reef.

I have been asked by a shareholder to mention whether the south reef has been cut in the new vertical shaft, and with what results. The reply to this question is that the south reef was cut at a depth of 2,263 feet, and at the point of intersection gave an average value of 1.8 dwts. over the usual stoping width. In all, 725 feet have been driven on the 19th, 20th and 21st levels, but the assay results obtained show unpayable values. In view of the good results which have been obtained on the main reef leader, I think there is no cause for disappointment in this fact, as experience of the Rand shows that though good values might be obtained in one reef or the other, it is exceptional to get them in both. The concluding paragraph in Mr. Wilkinson's report, in which he states that in his opinion the general outlook for your mine is better than it has ever been, must be regarded as extremely satisfactory.

The Rebellion.

Your consulting engineer, in referring to the probability of improved profits, makes a reservation in regard to labour, and the fact that he exercises caution in that respect cannot be wondered at when one considers the many and various causes which affect our labour supply. For some months past we have been well supplied with labour, and, as the summer is now well advanced, it seemed as though there was no cause for anxiety. Unfortunately at the present moment some of the natives appear to be somewhat uneasy on account of the rebellion, and it might be that many natives who would be seeking employment at this time of the year will delay coming to work till the condition of affairs is more settled. I think we all agree that this trouble is being most ably dealt with by the Government, and therefore feel convinced that it will be but short-lived, in which case, no doubt, any uneasiness which some of the natives might experience at the present time will be quickly allayed.

My remarks would be incomplete without reference to the position which was created through the outbreak of war in Europe. The fact that the mining industry has so steadily continued its operations must be a source of the greatest satisfaction to the people of the Union of South Africa; in fact, one cannot easily imagine what the position of affairs in South Africa would have been had the operations of the industry been interrupted. At the outbreak of hostilities there were many questions to be arranged in regard to the supply of stores, the disposal of gold and the provision of funds to meet the necessary expenditure. With the assistance of the Imperial and Union Governments, the Bank of England, the banks of the Union, representatives of the mining groups in London and our leading commercial men, all these questions were satisfactorily settled, and it is difficult to sufficiently express the appreciation of those responsible for the running of the industry for the assistance rendered.

Splendid Spirit of Employes.

I should like also to refer to the splendid spirit shown by the large number of the employes of the mining companies who are on active service, either as members of the Defence Force, Reservists of the Imperial Army, or Volunteers in the well-known and popular regiments of the Rand. It is a matter for the greatest gratification to know that the men connected with the mining companies, whether employed in the technical departments, on the staff, or in mining work, have shown their readiness to bear their share in the stupendous task which the Empire has in hand; and though the mining companies have already supplied a large number of men who are serving with the forces, I am quite sure there would have been no difficulty in at least doubling that number. There is a large number of men at present engaged in their ordinary occupations, who were ready and anxious to serve with the forces, but they realised that it was impossible for the mining companies to consent to their volunteering, if the industry was to be kept running without interruption. They know that it is the wish of the Government that mining work shall not be restricted, and they have unselfishly put their own inclinations on one side, in order to assist in the attainment of that object. I am sure you will agree with me in the opinion that those who are acting in this way are assisting the cause which we have at heart as loyally and materially as those who are actively engaged in the field. And, in addition to the services rendered in this way, the employes of the mining companies are contributing to the various relief funds in such a generous manner that their action is winning general admiration.

I think you are all conversant with the arrangements come to by the Chamber of Mines, as representing the mining companies, in regard to employes who are on active service, and I feel confident that the action of your directors in conforming to the decision arrived at by the Executive of the Chamber of Mines will have your hearty approval. The mining companies also contributed the sum of £30,000, which was placed at the disposal of General Botha, to be used at his discretion, for the alleviation of the suffering among the troops, either through wounds or illness. The amount which your company subscribes to that contribution is £298, and in regard to this matter also I feel sure that the action of your directors will be warmly endorsed by you. I now beg to formally move the adoption of the reports and accounts, as submitted.

Mr Goldmann seconded and the motion was carried.

The retiring directors were re-elected and the auditors reappointed.

MAIN REEF WEST.

Development Policy.

Labour Position Improved.

Mr. W. H. Dawe, the chairman of the company, in moving the adoption of the report of the directors and the accounts at the annual meeting of the Main Reef West, Ltd., last week, said:

Chairman's Speech.

Gentlemen,—The financial statements, directors' report and the reports of the consulting engineer and general manager, which are now before you, are for the year which ended on the 30th of June last. From the information contained therein you will have gathered that the results of operations during the period under review were very disappointing. At the last annual meeting I referred at some length to the work which had been done in the western section of your property, and then pointed out that it was hoped that with the completion of the sinking of that shaft, and the greater facilities for development thus afforded, the ore reserves would have been materially increased, but that the results had fallen much below expectations, as practically the whole of the western development had been of low grade, and a large percentage of it unpayable. The same remarks might be applied to the work of the past financial year in this section of the property; the exception has been the development in the extreme west, on the 10th and 11th levels, which continue to expose good values, but unfortunately the drives on the 12th and 13th levels were very unsatisfactory, and you can readily understand the remark of your consulting engineer to the effect that this is the most disappointing feature of the year's development. As the poor results obtained in the western section continued, our object has been to hasten the intersection and development of the reef in the lower levels of this area, hoping that a better zone might be obtained in depth. In the eastern section a similar policy has been followed, and the reef has been cut on the 13th level. A hundred and seventy feet of driving has been accomplished, that is, 85 feet east, which gave an average assay value of 3.6 dwts. over 48 inches, and 85 feet to the west, which gave an average of 3dwts. over the same stoping width. The reef should be intersected on the 14th level in about six weeks' time. During the year 12,454 feet were driven, raised and sunk that is exclusive of shaft sinking, stations and ore bins and this figure compares well with 12,901 feet accomplished in the previous year, as we suffered from a serious shortage of native labour as a consequence of the strikes in July, 1913, and January, 1914. Last year the average number of underground boys employed was 1,299, as against an average of 1,758 for the previous year, and consequently the percentage of machine stoping during the past year rose from 48.5 to 60.4. During the last few months the labour position has much improved, and we felt assured that, as we are now in that part of the season which is generally most favourable to recruiting, we should have no further anxiety in regard to this point for some time to come. The unsettled state of affairs during the last few weeks seems to have had the effect of creating a certain amount of uneasiness among a portion of the natives, and very possibly it has kept many from coming to look for work. I am inclined to think that this little set-back is purely temporary, and that the natives will very quickly realise the true position of affairs.

Ore Reserves.

In regard to the ore reserves, only 41.8 per cent. of the reef exposed during the year was payable, and 121,110 tons, of an average value of 5.9 dwts. over a stoping width of 49.4 inches, were added to the reserves, which show a decrease of 65,390 tons, standing as they did on the 30th of June at 526,440 tons, of an average value of 5.7 dwts. over a stoping width of 53.5 inches. This value shows a fall of .3 dwt. per ton.

Accounts.

The working profit for the year amounted to £56,641, and to this we have to add the sum of £5,873, which represents the value of the gold obtained from the final clean-up of certain plates which will not be required in the new tube mill plate house to which a portion of the battery plates were transferred. These amounts together give a profit of £62,514; the decrease in the working profit, as compared with the previous year, was £33,881. It is almost unnecessary to point out that this is due to the fall in the yield, and to the increase in the working costs arising from the smaller tonnage milled due to the restricted labour supply.

The appropriation account is summarised in the directors' report, and reference to it will show you that at the commencement of the financial year there was a credit balance of £19,261, and at the close we carried forward a balance of £23,414. In regard to the redemption of debentures, it was not necessary to make the annual drawing for redemption, as the board was able to purchase, in the open market, the amount required to be redeemed in accordance with the debenture trust deed at an average of £73 18s., including expenses. In connection with capital expenditure, you will notice that practically the only item of importance is that in connection with shaft sinking.

Supply of Stores.

In regard to the condition of affairs which has resulted from the outbreak of war in Europe, the gold mining companies have every reason to be satisfied with their position in connection with the supply of stores, and also the arrangements which they were enabled to make for the disposal of the gold and the provision of funds to meet current expenditure. Those responsible for the successful running of the industry are greatly indebted to the Imperial and Union Governments, the Bank of England and the local banks, as well as to the leading commercial men of this town, and the representatives of the mining groups in London, for the valuable assistance rendered.

As you are aware, the employes of the mining companies are strongly represented in the forces now on active service, as reservists, members of the Union Defence Force, and Volunteers. It would be difficult to speak too highly of the spirit shown by our employes, and, while giving the highest praise to those who so readily undertook their share in the defence of the Empire and the Union, I should like to express the opinion that equal praise is due to a very large number of the mine employes, who, while wishing to go on active service, have unselfishly put their natural inclination on one side and continued their ordinary work with the object of assisting to carry on mining operations without restriction. How necessary it is that this work should be carried on it is quite unnecessary for me to emphasise; the serious consequences to the Union which would have arisen had our work been in any way curtailed will readily occur to you. I am quite sure you will agree with your directors in their view that it devolves on us to do what we can to aid those who are fighting for our interests, and therefore I am confident that you will approve of the arrangements which have been made by the Chamber of Mines, and agreed to by the various companies, in regard to men who are on active service, and will also approve of the donation which was made by the Chamber of Mines of £30,000 to be utilised at the discretion of the Government for the alleviation of the sick and wounded. Your company's share of this contribution amounted to £204.

There is just one other point which I think merits attention, and that is the manner in which the employes of the mining companies are contributing to the various relief funds. It would be difficult to speak too highly of the generosity displayed, and when one notices the large additions which are made to the relief funds each month one realises the results which can be attained by united and sustained effort.

The motion for the adoption of the reports and the accounts was carried, the retiring directors were re-elected, and the auditors reappointed.

Coaling German War Vessels.

Amongst important captures recently made on the seaboard of the North Sea, several are of first importance in so far as they affect the operations of the enemy's submarines. There seems no doubt, says the *Scotsman*, that during the past three weeks the submarines of the German Navy have been active at such a distance from any possible harbour base that, in view of the ascertained limit of the range of action of those vessels, as well known to the Admiralty, the problem came to be: Where, and of what character, are the German submarine supply ships? Further explanation of the extensive range of action of the submarines of the enemy, continues our contemporary, has been afforded within the past few days. At a port on the East of Scotland there arrived a vessel of a neutral Power, an innocent trader with an innocent cargo in her hold, her papers in order, and her general character apparently irreproachable. Customs searchers subjected the vessel to the most careful scrutiny. They found a lavish stock of spare hawsers. When the wrappings of these hawsers were stripped, the great coils were little more than basket rope, and in each basket, nicely protected and well stowed, reposed a steel drum of oil fuel for submarines. The Press Bureau state that they have had no information of the seizure mentioned above. The Capetown correspondent of the *Times* has given an instance of the completeness of German plans for coaling their Navy in the event of an outbreak of war. A German cruiser, the "Eber," was in dock at Capetown a few days before the outbreak of war, and got away just in time. An intercepted letter, addressed to the commander, contained certain instructions from Berlin which were dated Jan. 11. These instructions revealed a complete system for coaling the German Navy on the outbreak of war through secret service agents in Capetown, New York, and Chicago. The commander of the "Eber" was given the names of shippers and bankers with whom he could deal confidently, the essence of the plan being that a collier would leave Table Bay ostensibly bound for England, but really to meet a German warship at an agreed rendezvous. British coal exporters seem to have reason for thinking that the difficulties of coaling the scattered German cruisers will increase with the passage of time. It is estimated that early in July there were between 20 and 30 colliers outward bound to German depots with Welsh steam coal. The belief exists that some, at any rate, of these colliers never reached their intended ports, but were diverted to rendezvous for the coaling of German cruisers or auxiliary cruisers. Coal merchants scout the idea that purely British firms would stoop to enter into any arrangement for providing coal for enemy warships, though they admit that the case of firms in which there is known to be a foreign element deserves to be carefully considered.

Decreased Railway Earnings.

The decrease in the railway earnings during the week ended the 21st of November as compared with the receipts for the corresponding week in 1913 is £25,071. The earnings amounted to £[illegible], and the decreases were under all heads except live stock, which showed an improvement of £1,304. The decreases were: Passengers £10,217, parcels £2,614, goods £6,436, coal £4,155, and miscellaneous £1,099. The depreciation in the weekly average since the 1st of April last, as compared with the figures for 1913, is £13,615, the figures being: 1914, £221,965; 1913, £235,580. The total receipts from the 1st of April to the 21st of November have been £7,455,637, which is £458,277 less than the amount earned during the corresponding period of last year. The decreases are on all heads except live stock.

S.A.R. War Relief Fund.

SECOND DONATIONS.

The October monthly contribution, which is the second to be made by officers and employees of the South African Railways to the War Relief Fund, amounts to the splendid total of £4,329, thus bringing the grand total of the fund up to £8,031. This amount, which is the practical result of only two months' appeal, has been voluntarily subscribed for distribution amongst the various sections of the war funds. Taking into consideration the large number of funds, both national and local, connected with the war, and the countless calls which are being made upon the purses of the charitable, we may well congratulate the railwaymen upon the generosity which they have displayed. The total of the October collection would be larger probably by nearly £400 if the figures of the Orange Free State had been available, when going to press, but, notwithstanding this omission, the amount shows an advance of no less than £628 over the previous and first month. May the increase in the contributions be maintained undiminished for as long as there is need of this fund.

"Goldfields" Annual Meeting.

Lord Harris, presiding at the annual meeting of the Consolidated Gold Fields of South Africa, Ltd., this week in London, said the position of the company at the end of the financial year certainly did not justify drastic writing down, but the upheaval in business compelled the directors to provide for unforeseen circumstances. Possibly they were being over cautious. Continuing Lord Harris said there was an extremely anxious state of affairs in South Africa. They all sincerely hoped General Botha, that gallant soldier and Minister, would crush the treacherous outbreak which was threatening the stability of the Government. He did not doubt that General Botha would do it. When that was concluded, however, there remained the most difficult and expensive task of lowering the German flag in German South-West Africa. There would also be legislation inevitably leading to greater expense to the mining industry. He emphasised that the cash position of the company was satisfactory.

Captain W. G. F. Barnard, who, in partnership with Mr. Jas. Anderson, has made the Jollie-Bright mine, at Sabie, a success, has left for England to rejoin his old regiment, the "Buffs."

* * * *

Mr. D. Frame is now in charge of the Pilgrim's Creek gold mine.

Durban Roodepoort Gold Mining Co.,

LIMITED.

(REGISTERED IN ENGLAND.)

NOTICE IS HEREBY GIVEN that an Eighty first (81) Interim Dividend of Fifteen per cent. (15%), equal to Three shillings (3s.) per share, has been declared, payable on and after the 22nd of December, 1914.

Holders of Shares to Bearer should present Coupon No. 81 for payment of the above 3s. (Three shillings) per share at the Standard Bank of South Africa, Ltd., Johannesburg Branch, on and after the 22nd of December, 1914.

W. A. MARTIN.
W. MACFARLANE.
L. CLARENCE.
Local Directors.

Johannesburg.
21st November, 1914.

THE SOUTH AFRICAN

Mining Journal,

WITH WHICH IS INCORPORATED

South African Mines, Commerce and Industries.

ESTABLISHED 1891.

VOL. XXIV., PART I.] DECEMBER 12, 1914. [No. 1211.

HEAD OFFICE: 176-180, Stock Exchange Buildings, Fox Street (2nd Floor), Johannesburg, Union of South Africa.

Telephone **913.** P.O. Boxes **963** and **418.**

Cable and Telegraphic Address: **"MINING JOURNAL."**

AGENTS FOR GREAT BRITAIN: Argus Printing and Publishing Co., Ltd., Byron House, 82-85, Fleet Street, London, E.C.

AMERICA: Advertisements accepted from any recognised Advertisement Agency.

ANNUAL SUBSCRIPTION RATES: Oversea, £2; South Africa (by post), £1 10s.; Local Delivery (Town only), £1 6s.

Copies of this journal are obtainable at all Branches and Agencies of the Central News Agency, Ltd., at all News Agents and Railway Bookstalls throughout South Africa, and at the London Agency as above.

NOTICE.—The postage of this issue of the *S.A. Mining Journal* is: South Africa, 1d. All other parts, 1½d.

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Notes and News.

Daggafontein Suspends Operations. Operations at the shaft of the Daggafontein G.M.—which, it will be remembered, recently cut the reef, showing good values—have been temporarily suspended. Some natural difficulty in raising the further capital required is the reason, but that difficulty is due, of course, solely to the war and is not affected by the outlook for the property itself, which remains excellent.

* * * *

The Rand Dividend Outlook and Bank Deposits. Although the majority of the Rand dividends will not be announced till next week, there are already signs that they will be at least up to the usual standard. First among them, the Village Main Reef Gold Mining Company has declared a dividend of 7s., or 35 per cent., which is the same rate as that for the corresponding half of 1913. In some quarters there seems to be a fear that the locking up of sums deposited by Rand companies with certain German banks will affect the finances and, consequently, the dividend declarations of those companies. We are, however, assured that this is not the case, and that profit distributions will not be affected.

* * * *

Van Ryn G.M. The annual report of Van Ryn Gold Mines Estate, Ltd., shows a net profit of £254,526, as against £272,920 for the preceding year, and £276,235 for the year before that. After the payment of dividends the sum of £16,165 has been carried forward. For the preceding year the balance carried forward was £18,200—so that the figures now published are just a little below those of the preceding year, which was a record one for the company.

* * * *

Latest Wolhuter Development. In the three months ended October 31, the Wolhuter milled 78,200 tons of ore of an average assay value of 6·199 dwts. In the same quarter there were developed 111,291 tons, of an assay value of 5·53 dwts. over 60 inches. The ore reserves are being re-calculated and will be shown in the forthcoming annual report. The machinery and plant continue in good working order.

* * * *

Lapsed Mining Claims and Licences. Despite the consideration which the Minister of Mines is understood to be extending to claimholders affected by the war and rebellion, there is a noteworthy drop in the number of claim licences held in the Transvaal since the beginning of the war. Thus, of prospecting permits the number fell from 475 on June 30, to 413 on October 31; of prospecting claims the number dropped from 67,848 to 63,322. Base metal claim licences showed the biggest fall of all, the number at October 31 being only 30,514 against 35,701. The total number of claim licences of all kinds decreased from 114,976 to 105,323 in the period. Some explanation of these figures seems desirable.

* * * *

"Safety First" and Increase of Inefficiency. In the absence of the November statistics it is impossible to state whether the accident rate has increased, though the belief seems general that the month was a bad one for accidents on the mines. An examination of the statistics for the first three months of the war reveals, oddly enough, an improvement in this respect, though the number of white workers had declined absolutely and relatively to black, owing to war-recruiting activity on the mines. That the standard of white men's efficiency on the mines is falling appears, however, to be a widely held opinion; and the reason therefor does not appear to be clear. The process of losing the old hands, of course, goes on, though not, we believe, to the same extent as in the pre-phthisis-prevention days. It is a fact, we understand, that many good miners have gone to the front, and it speaks [illegible] the patriotism of highly paid development contractors that they should volunteer at 3s. a day to fight their country's battles. Many of the best men have thus been temporarily lost to the mines, and the result is an all-round reduction in white efficiency. On some mines, moreover, where experienced shift bosses, etc., have been allowed to volunteer, the accident rate has shown a perceptive upward curve. The lesson will doubtless not be lost on all concerned, though the moment is plainly not propitious for preaching the peaceful doctrine of "Safety First."

* * * *

Base Metal Mines and the War.

Surprisingly little damage has been done to the "outside" mines by the rebellion or the war. The only official references, so far, to the G.S.W.A. operations is contained in the following extract from the report of the Namaqua Copper Company: —"The plant was kept in continuous use. 567 tons of low grade ore were added to the heaps. Shipping: Owing to the port and railway being required by the Government in connection with the war, shipping and landing have been considerably delayed." Rooiberg Minerals Development recently cabled to London: "Recent fighting near Rooiberg resulted in one employee killed and one wounded. No damage to property. Recreation hall utilised as hospital, treating large number wounded. Operations at mine so far not interrupted."

* * * *

Messina (Transvaal) Development.

With a fair copper market, it is clear from the annual report of the Messina Company to June 30 that the mine in a year or two will wipe out the loss resulting from the Canadian Agency failure. The new plant only commenced running towards the end of January, and under these conditions the profit for the year, on a realised price for best selected of £68 13s., after allowing for debenture interest, profits tax, and depreciation, was £45,181. This and the share premium account have been applied to writing down the loss referred to, reducing it to £102,967. A substantial saving in expenses has been effected by the new mill, and in the present year Mr. Calderwood looks for increased production and good profits, even on a lower metal price. Mr. Frecheville estimates the cost of producing a ton of copper at £38 16s. The ore reserves have risen by 22,000 tons to 252,000 tons, and in addition there are 140,000 tons partly developed. Development assays do not compare well with the past, averaging only 4·1 per cent. over 60 ins., though sorting will much improve the grade. A smelter costing £40,000 is recommended as likely to produce many advantages.

* * * *

Optimistic Report of Chartered Co.

The report of the Chartered Company, covering the two years March 31, 1912, to March 31, 1913, and of March 31, 1913, to March 31, 1914, was issued this week. Dealing with Southern Rhodesia, the report states that the established commercial policy of the company has been energetically carried out with eminently satisfactory results, the company assisting to find markets and to promote co-operation. There has been a gratifying growth of the co-operative spirit. The company has greatly extended the development of ranches and the estates, and is already the largest European cattle-owner in South Africa. The ranching enterprise has been conceived on a scale of exceptional magnitude, but as yet has not been developed. The opportunities offered by Rhodesia for meat producing could hardly be exaggerated. Experts are unanimous regarding its merits as a cattle country. It is anticipated that the gold output for 1914 will exceed that of 1913 by £750,000. The development of Northern Rhodesia is proceeding on similar lines, but adapted to the requirements of a community in a less advanced stage. The accounts showed a steady progress, the Board's aim being the building up of a steadily-growing revenue from a number of sources. The commercial revenue to March 31, 1913, exceeded the expenditure by £86,782, and from March 31, 1913, to March 31, 1914, by £86,135. Ample provision has been made against possible losses, so that when the conditions were normal and the net profits otherwise warranted the payment of a dividend this would not be delayed by the necessity of applying profits in the first instance to writing off.

* * * *

Skip Accident at the Simmer Deep.

A skip accident, caused by the rope breaking, at the Simmer Deep G.M., occurred on Monday. Four deaths resulted, three being of natives. The enquiry into the tragedy is proceeding, but as yet has revealed little which throws any light on the occurrence. The fact, however, has been brought to light that there was formerly a pent house of several hundred tons of material across the inclined way, near the 19th level, to protect the men working beneath. This was removed only on the Sunday previous to the accident, as it was anticipated that the job on which the dead men were engaged—of extending the rails to the 21st level—would have been completed on the Sunday, while no hoisting was being done in the shaft. Still, even had the pent-house remained, it is doubtful whether it would have withstood the shock of the skip and five tons of rock falling nearly half-a-mile.

* * * *

First Aid Certificates.

In their report the Committee appointed to inquire into the granting of First Aid certificates in the United Kingdom recommend that official recognition of such certificates should no longer be confined to those issued by the St. John and St. Andrew's Associations, but that certificates issued by all responsible bodies teaching first aid and ambulance work in the various mining districts should be recognised, subject to conditions to be laid down by the Home Office. Four such conditions are suggested by the Committee.—(1) That the standard of instruction should be at least equal to that of the two Institutions above-named; (2) that the teaching should have special reference to mining conditions; (3) that the course of instruction and examination should be approved by the Home Office; and (4) that the examiners should be independent medical men of good standing. That the recommendations of the Committee are sound in principle will, we think, be generally conceded. It was, of course, to be expected that old and well-tried bodies like the St. John and St. Andrew's Associations should view with some misgiving, and perhaps a little natural jealousy, the proposal to allow their responsibility in this matter to be shared by others; but if the conditions suggested are accepted by the Home Office it seems clear that the step proposed will be accompanied by all reasonable safeguards for ensuring the maintenance of a high standard of efficiency on the part of candidates.

* * * *

Transvaal and Delagoa Bay Co. Finances.

At the annual general meeting of the Transvaal and Delagoa Bay Investment Co., Ltd.—reported in a recent issue—Mr. S. C. Black, who presided, referred especially to the sound position of the company as reflected by the report and accounts presented for adoption. The net profit, after making ample provision for depreciation, and including in the working costs a considerable expenditure which might conceivably have been charged to capital expenditure, totalled £4,182 7s. 11d., whilst the cash assets had been increased to £94,965 2s. 7d. A dividend of 17½ per cent. was declared for the year ended August 31, 1914, and leaving £96,046 19s. 8d. to be carried forward to profit and loss account, after writing off a further sum of £5,000 in reduction of the company's own branch railway line. The coal seam in the new area acquired in 1913, and in the mine generally, fully maintained, both in width and quality, the high standard of previous years. The remodelling and equipment of No. 1 plant with most up-to-date machinery had been completed, and might be regarded as an auxiliary plant ready to meet any demand for larger supplies, and thus materially augment the company's present output at the shortest notice. The output from the company's collieries for the year was a record one. That the net profit did not appear commensurate with the larger output was due to the increased provision made for depreciation and the inclusion in costs of as much expenditure as was possible.

Orenstein and Koppel.

A discussion of interest on the Rand has taken place in the First Division of the Edinburgh Court of Session on an application presented by Orenstein & Koppel — Arthur Koppel Amalgamated, St. Clement's House, 27, Clement's Lane, London, E.C. The company are pursuers and appellants in an action against the Egyptian Phosphate Company, Ltd., 188, St. Vincent Street, Glasgow, for alleged breach of contract. The pursuers submitted that in respect of the various Proclamations made they were entitled to be heard in His Majesty's Court on matters contained in the present case. For the Egyptian Phosphate Company, Ltd., counsel said that the case raised questions of national policy, and his clients had considered that it was not their duty either to oppose or consent to the motion, but to give the Court all the information they could. The pursuers were registered in Germany and filed certain particulars with the Registrar in this country. The shares were held by German subjects. He thought that the company must be regarded as a German one. His understanding was that the money would be transmitted from London to Berlin for distribution among German shareholders. He thought that the exception provided in the Proclamation did not apply to such a transaction as the one in question. Judgment was reserved.

* * * *

The Hadfield Prize.

A research prize of the value of £200 has been placed by Sir Robert A. Hadfield, F.R.S., past president, at the disposal of the Council of the Iron and Steel Institute, to be awarded by the Council for original research work on the subject of the different forms or combinations of carbon in iron, steel and alloys of iron with other elements. Competition for the prize is open to metallurgists, chemists and others interested in metallurgy, and it is proposed that the prize shall be awarded at the annual meeting of the Institute in May, 1916, for the best report presented before February 1, 1916. Sir Robert Hadfield is also prepared to offer a second prize for the report next in merit to the one which gains the first prize, provided it is adjudged to be a really meritorious paper. It is not desired to limit the scope of the research too closely, but it is suggested that the work should be in continuation of, or based upon, the work of previous investigators, such as Jullien, Abel, Muller, T. Sterry Hunt, Ledebur, Akerman, Arnold, E. D. Campbell, Hogg, Parry and others. Intending competitors should communicate, in the first place, with Mr. G. C. Lloyd, secretary of the Iron and Steel Institute, Victoria Street, London, S.W.

* * * *

October Mining Statistics.

The statistics issued by the Department of Mines and Industries for the month of October show that the average number of white persons in the service of companies and companies' contractors in the whole Union was 21,961 as against 22,088 in September, the coloured labourers numbering 185,169 as against 183,911 in the previous month. Except four, all the white men were engaged in mining work in the Transvaal, and 21,122 were in the Witwatersrand area—20,757 on producing and 365 on non-producing mines. The Witwatersrand area accounted for 173,745 of the coloured labourers employed, of whom 1,962 were on non-producing mines. The reef and alluvial white diggers numbered 83 in the Transvaal and 93 for the whole Union, 677 being the total number of coloured labourers employed. 2,086 white men were engaged in diamond mining in the Union, of whom 1,519 were in the Cape, 293 in the Transvaal and 274 in the Free State. The total number employed in September was 3,040. The coloured labourers were 1,682 as against 1,877 in September. An average of 595 white men were employed in Transvaal coal mines, 66 in the Cape, 128 in the Free State, and 507 in Natal, or 1,296 in all. The total coloured labour force was 25,191. 284 white men and 2,792 coloured were engaged on base mineral mines in the Transvaal, the figures for the whole Union being 459 and 4,761 respectively, and 51 white men and 917 coloured were employed in lime and flint works in the Union. Silver was produced during October to the value of £8,816, coal to the value of £181,528, and base minerals to the value of £47,691.

TOPICS OF THE WEEK.

THE SHAREMARKET AND THE GOVERNMENT.

Seldom has the outlook for Rand mining shares been more interesting than at the present moment. Numbed by actual war and passing rebellion, and distracted by vague, undefined fears for the future of a world in arms, shareholders have seen the market valuation of the Rand drop by millions in recent months. The depreciation, as a fact, is less than might have been expected in the circumstances, but even still it cannot be justified on grounds of intrinsic value. As Mr. Hennen Jennings opportunely reminds us in a recent address, from which we print an extract in this issue, the share market invariably tends unduly to exaggerate or depress the value of a mine, and we believe the effect of world-happenings in the past four months has been unduly to depress the prices of Rand mining shares. Reasons for our belief may be briefly enumerated. Rand directorates are meeting daily to discuss the December dividend declarations, and it is known already that the forthcoming distributions will be quite up to normal and, in some cases, better than normal. At a time when industry is at a standstill on the Continent of Europe, and in other countries monetary stringency hampers profit distributions even in the industries where they are earned, this payment of "dividends as usual" by the Rand is bound to prove a unique advertisement. With diamond mines in the doldrums, base metals suffering from lack of smelting facilities, and shipping restrictions interfering with coal and iron mining activities, the triumph of Rand industry over all obstacles will continue to attract an increasing measure of world-comment. Without facilities for the exchange of Rand shares, of course, the interest of investors cannot translate itself into tangible shape. In this direction we are glad to learn that considerable progress has been made during the week. In London an increasingly free market in South African shares now offers, and the Union Government is understood to be about to gazette authority to the Johannesburg Stock Exchange Committee to frame such rules as are requisite to facilitate local business. Added to these things we have the fact that the war has brought home even to the unthinking in a strikingly dramatic manner the twofold importance of the metal gold, *i.e.*, as a medium of exchange as well as a standard of value. To us it is a matter of constant surprise these days to find experienced men of affairs re-discovering for themselves, with unconcealed wonderment the truth of these copy-book platitudes. Some of our Stock Exchange friends, at any rate, have lately unearthed that because the product of Rand industry is gold and not, say, green cheese, the fact constitutes a big bull point for Rand shares. Even these optimists, however, admit that there is another side to the shield. It is coming generally to be recognised that after the war enormous attractions will be held out to capital to participate in the rehabilitation of Belgium, and the devastated portions of the other belligerent countries. Capital, of course, will flow towards those fields where its rewards will be highest: and in the process the investment possibilities of Rand mining shares may be temporarily overlooked. A ten per cent. return may then be nothing to scramble for; and the best testimonial the industry may then be able to adduce may be its record of to-day in maintaining, unchecked by world war, the even tenor of its dividend-paying way. Nor is this feared future competition for capital the only lion in the path. Already there are frightened whispers of increased taxation to meet the public expenditure of these troublous times. It is even hinted that within the mysterious precincts of the Ministry for Finance at Pretoria is already prepared and secreted a scheme for increased taxation, against the day when the bill for current extraordinary expenditure comes to be presented. We are not inclined to attach too much credence to these rumours. The cost of the present struggle—internal and external—by the Union will doubtless be shared by the Imperial Government, and recouped out of the indemnity from the common foe. And it is inconceivable that the mining industry of the Rand, which by the strenuous efforts of all concerned has not spared itself in helping to maintain the credit of the British Empire, should be penalized for its success. A more immediate danger, we believe, is the possible rush of German shareholders in Rand companies to liquidate, through neutrals, but this contingency has now been discounted and the successful re-opening of the Paris Bourse appears to have dispelled fears under this head. Genuine investors, at any rate, need have no misgiving on that account, and, as we have already indicated, there never seemed a time when the investor, buying with circumspection and after due weighing of all the facts now ascertainable in regard to each and every company on the Rand, could do better than to-day. And it is because we realize that the measure of the investor's satisfaction will be the measure of his readiness to provide the globular sums still required to enable the Rand to realize its full possibilities that we have no hesitation—indeed, we deem it a public duty—to emphasize the good points of the situation, when and as we see them.

ENGINEERING PROGRESS ON "GOLD FIELDS" MINES.

Of the Rand groups which are companies, or companies which are groups, the Consolidated Gold Fields of South Africa, as usual, is the first to review the year ended July 31. Strikes and new legislation and the shadow of the great war dominate the reports of the company published here this week, and there is no outstanding feature of mining interest like Mr. H. H. Webb's famous statement on "values in depth," issued last year to enrich the whole. The financial position, moreover, cannot properly be appraised till the Chairman's analysis of the allocation of depreciation, etc., under the heads of countries of investment is available, and a detailed review may therefore be withheld till the report of the annual meeting is to hand. There is nothing, however, to prevent us from giving in full in this issue the annual reports of the General Managers in the Transvaal, or noting the principal features of the views expressed by Mr. C. D. Leslie, the Superintending Engineer of the company on the Rand. The mining, mechanical and metallurgical departments of the Consolidated Gold Fields have a high reputation to maintain, and it is of interest and value each year to note their work and progress. Their record on this occasion is, perhaps, less spectacular than usual, and is mainly made up of small improvements and scattered gains in the direction of economy and efficiency, that, in the sum, doubtless, represent a real forward movement. Thus, it is shown that the residue value of ore averaged 0·243 dwt. per ton treated by the mines of the group, equivalent to an extraction of 95·014 per cent. Under existing conditions, and in accordance with the principle of obtaining the maximum net profit per ton of ore treated, it would, in Mr. Leslie's opinion, appear that the economic limit of extraction has been practically reached on the mines of the group, and that any further increase in the percentage extraction would cost more than the value of the additional gold recovered. Again, of the total tonnage mined by the group, 57·8 per cent. was broken by machine drills, being an increase of 3·7 per cent. over the previous year. "Hand drilling," we are told, "is being superseded slowly and gradually by machine drilling, and the natives released from hand drilling form a welcome addition to the coloured labour supply for other classes of mine work. The use is being extended of hammer drills, which are water-fed so as to lay the dust from drilling." Mine hygiene naturally bulks large in Mr. Leslie's report. Much benefit, he says, is resulting from the attention being directed towards improving underground health conditions, more especially in regard to lowering of temperatures and reduction of dust in mine workings. "The results from recent sampling show that improvement in dust allaying has been effected in every mine of the Witwatersrand. The mining industry can look forward confidently to improvement in the knowledge, means, skill and attention brought to bear on laying dust at every necessary point." It is noteworthy that as the result of experiments carried out during the year at the instance of the "Gold Fields" Metallurgical Department, it has been found possible to materially increase the crushing capacity of tube mills by means of a scoop discharge at the outlet end, which lowers the level of the fluid pulp in the tube mill. The efficiency of the classification of sand and slime has been improved by the installation of automatic regulators for the tailing pulp and sand-filling diaphragm cone classifiers. Moreover, it is satisfactory to note that sand-filling operations are being extended on the mines of this group. From recent experiments conducted at the Simmer and Jack mine it would appear that the percentage of water, de-watering cone area, and size of pumps and piping are all capable of reduction, with a consequent saving in capital expenditure and lower operating costs. An estimate is now being prepared for increasing the sand-filling plant at the Simmer and Jack for the purpose of sending all current sand residue underground, and it is proposed to sink boreholes and instal plant for sand filling at the Knights Deep property. The "Gold Fields" Mechanical Engineering Department has given close attention to the many details of its work, and substantial economies and mechanical improvements have been effected during the year. Progress is being made slowly with detachable bits for rock-drilling, and as the water feed equipment of machine drills improves it is expected that these bits will be used more extensively. Mr. Leslie adds that the Central Pumping Scheme, referred to in last year's report, by which all water from the underground workings of the Simmer and Jack, Knights Deep and Simmer Deep is centralised and pumped to the surface through the Knights Deep Lohse shaft, is now in successful operation, and further attention has been paid to the conservation of water and to economy in its use. The neutralization of acid mine water by means of very finely crushed carbonate of lime has been extensively developed, with the result that the corrosion of pumps and piping underground is being reduced and a considerable saving in the consumption of burnt lime in the reduction works is being effected.

LATERAL v. DEEP EXPLORATION ON THE RAND.

That hardy annual, the question of persistence of ore in depth invariably makes its appearance about this season of the year. To Mr. T. A. Rickard we are again indebted for its resurrection, and we may say at once that he is to be congratulated on the form and manner of its presentation before the last meeting of the Institution of Mining and Metallurgy. The paper on the subject read by Mr. Rickard traces the history of the controversy, reviews the various authoritative contributions to the long-drawn-out discussion, quotes a wealth of data and illustrations from actual mining all the world over, and concludes with some apparently irresistible sledge hammer deductions. The portion of his paper dealing directly with the Rand, we print in this issue; further extracts containing the statement of his premises and conclusions will appear. As regards the Rand, Mr. Rickard naturally quotes Mr. H. H. Webb with enthusiastic approval, and twits Mr. H. F. Marriott on his recent silence on the subject. Where learned doctors, of such privileged opportunity to judge, disagree, it is not for us to decide, and we must content ourselves with reporting as faithfully as may be the varying fortunes of the discussion. One point, however, may here be noted. It represents, in fact, the constructive portion of Mr. Rickard's views.

> "If the money," he writes, "so often squandered on impoverished mines in the vain expectation of betterment in depth, or of indefinite persistence, were diverted to lateral exploration in localities highly mineralised, or spent in systematic trenching in new regions, we should, I believe, give to such capital the fruitfulness that is the economist's constant aim. In short, we must employ the cross-cut more and the shaft less, except, of course, where the ore body can be kept in view. Incidentally, I desire to commend the increasing use of diamond drill as a means of ascertaining the position of a lode and its general character in depth or at a distance from existing workings. While the drill is not a safe instrument for sampling a lode, it provides a highly economic means of obtaining that preliminary information on which wise development depends. The first rule in mining is to find ore: the second is to follow it. If the crust of the earth in a productive mining region were suddenly rendered transparent to the radio-active vision of a transcendental geologist, he would see, I feel assured, many an orebody that had been missed in the hurry to follow the lure of deep sinking. The fallacy of enrichment in depth has been the cause of much useless expenditure in deep exploration: the idea of persistence has led to the neglect of lateral development.

It is possible that the foregoing represents one of those really helpful suggestions which are all too rare in this age of cheap criticism.

UNDERGROUND POSITION AT THE FERREIRA DEEP.

Enquiry Into Recent Subsidence—How Sandfilling Has Improved Conditions—Satisfactory Outlook.

No report has yet been made as the result of the Mines Department enquiry into the recent subsidence at the Ferreira Deep. It seems to be generally agreed, however, that the fall of rock in the No. 2 shaft was caused by an earth tremor of exceptional severity, though whether the tremor in question was itself the result of a general settlement of the Central Rand strata caused by mining operations or was of direct volcanic origin is a moot point. As was recently pointed out in these columns, a large volume of data on the subject of Rand earth tremors has been entrusted by Mr. Kotze to Mr. R. A. Innes, for the purpose of aiding him in the preparation of a further paper on the subject, and, before expressing further opinions it may be well to await the publication of that paper. Meanwhile it is noteworthy that the annual report of the Ferreira Deep is due for publication about the 22nd inst., and some instructive light will doubtless be thrown therein on the underground position at the mine. The report for the year ended September 30, 1913, showed how strenuous and succsesful had been the efforts made to improve underground conditions, and a few extracts will reflect the changed situation. *Inter alia*, the Acting Consulting Engineer, Mr. Palmer Carter, then wrote:—

The large increases in the tonnages mined and milled in the year were in a measure due to the distinctly improved condition of the Deep shafts and workings, which allowed a considerably increased tonnage to be hoisted from the Deep mine; this was not only sufficient to supply the Deep mill to its full capacity, but in addition 42,631 tons, or an average of 3,553 tons per month, were trammed on surface and crushed at the Outcrop mill. The connection to the Deep workings from the Outcrop No. 1 shaft also allowed ore in the form of stope and former boundary pillars and blocked ground in the two upper levels of the Deep, previously inaccessible, to be mined through this shaft. In addition to the tonnage mined, 78,801 tons of ore were broken and were left in the current stopes of the Deep workings in the form of reef packs as support to the hanging wall, the cost of which has been borne entirely by the current working costs. Since the commencement of reef packing in May, 1911, 146,288 tons have been packed, whilst to date 17,619 tons have been withdrawn from these packs and sent to the mills. The improvement in the condition of the Deep shafts is most marked, due to the effect of the sands filling undertaken in their neighbourhood and the cessation of derailments has permitted not only the extraction of greater quantities of ore, but increased time for maintenance work. Although continuing to cost heavily for maintenance, the shafts no longer give continual anxiety as in the past, and there is now further spare capacity even above that reflected by the increased quantities of ore hoisted through them during the best months of the year. The Nos. 2 and 3 shafts of the Outcrop section have been permanently closed, and all hoisting in this section of the mine is now confined to the No. 1 shaft alone; the rich shaft pillars near the bottom of No. 2 shaft are being extracted, and have accounted, in a measure, for the high values latterly at the Outcrop mill; the transference of ore from the Deep shafts also favourably influenced the recovery at this mill. The present satisfactory condition of the Deep current workings is principally due to the system of reef packing employed. During the year some further sands-filling has taken place at the back of the Deep shaft, in the worked-out areas of both the Outcrop and Deep sections. No sands-filling has, however, been done since December last, any any further filling undertaken in the future need only be on a reduced scale. The improved condition and safety of the stopes has admitted of better efficiency being shown in all classes of work.

The Manager, Mr. F. J. Trump, also wrote, inter alia:—The system of reef packing for the support of the mine has proved successful throughout the year, and no extensive falls of ground have taken place. 78,801 tons of reef were packed and 17,619 tons withdrawn from packs during the year. Work in the bends and crushed portion of the incline shafts has been steadily proceeded with, and the shafts are now capable of dealing with a larger quantity of rock than is at present available. All four compartments of both the Deep shafts are identically equipped as far as man-cages, skips, tipping gear, ropes and pulleys are concerned, with considerable benefit owing to interchangeability. 17,616 tons of sand were lowered into the mine during the first three months of the financial year, principally into partially caved areas in the Ferreira section at the back of the Deep shafts, making a toteal of 771,604 tons lowered since June ,1910. The steadying of the ground in the neighbourhood of the bends must be to a large extent due to this sands filling.

DUST-ALLAYING PLANT AT THE FERREIRA DEEP DUMP.*

An Account of Successful Experimental Work—Details of Plant and Results Achieved.

[BY S. NEWTON, CYANIDE MANAGER, FERREIRA DEEP.]

THIS paper gives an account of the experimental work carried out in devising a successful method of allaying dust on sand dumps, of the plant installed in applying the process, and of the practical results obtained during the six months, May to October, of this year. The months named represent the worst period of the year, from the termination of the rainy season to the first rains of this year, and give the plant the severest test it is likely to undergo. The original experiments, initiated by the Metallurgical Department of the Rand Mines, were carried out on the deep section of the Ferreira Deep, from November, 1913, to March, 1914, when the results were so satisfactory that the management of the mine decided to erect an efficient plant on the lines of the experiment, which had been carried out on a smaller scale. In the first place, heaps of dry, fine sand, of about one ton each, were made in conical form in exposed positions, where they were exposed to normal atmospheric changes. The pumps used for spraying were the "Deeming" hand spray pumps. These experiments were carried out during the varying conditions prevalent during this period of the year, viz., heavy rains, and continuous light rains, and with heavy and light winds. The several heaps of sand were sprayed with any cake forming substance that suggested itself to those carrying on the experiments, and daily observations and notes were made as to the efficiency and cost of material used. Among these were: Water glass in combination with magnesium chloride, molasses, cement, slime residue pulp, crude oil, waste oil, and acid mine water, but owing to the action of rains and bad weathering, and from an economical standpoint, some other material, both cheap and handy, was required to make a success on a large working scale. It was then suggested by Mr. Trump, the manager of the Ferreira Deep, that salt had certain qualities which might solve the problem. Salt solution was made up to the density of sea water, and also to saturation. The sea water test gave a slight crust, but was not sufficiently durable to resist the varying weather conditions. The saturated salt solution gave a good hard and effective surface, which lasted a considerable period. At this time the question of mixing was suggested by the metallurgical staff of the Rand Mines, and those carrying on the experiments commenced by mixing certain parts of salt and residue slime pulp together, and spraying the mixture on to heaps of sand. This spray consisted of slime residue pulp (65% moisture), with 3.5% salt (on weight of pulp) added to it. The first result was so good that the heaps sprayed with it remained intact, while those which had been treated with other materials disappeared. There is obviously much to recommend the use of slime, as it is a residue material costing nothing and easily obtained, while the salt also is a very cheap local product.

Spraying on a larger scale was then commenced by the erection of a cone bottom tank holding four tons of pulp, fed by a branch from the delivery to the residue slimes dam, the slime being agitated by air at the bottom of the cone, and elevated by a Knowles air pump. A 1½ in. main was carried up the west side of the sand dump, which was sprayed by means of various shaped nozzles on a 1½ in. rubber hose. This spraying was carried on during the months of February and March, 1914, and owing to the promising results obtained under varying conditions, the management then designed a plant capable of dealing with the current residue dump. The plant consists of:—Cone-bottom tank (capacity 50 tons of 1 to 1 pulp), 10ft. in diameter, 12ft. 6in. in the vertical, cone 45°, ⅜in. plate, with 1in. air connection at bottom of cone, and suction pipe 2ft. above bottom of cone. Pump house, 20ft. x 12ft. One 6 x 8 in. Gould triplex-power pump, 168 lb. working pressure, revs. 45, driven by a 25 h.p. motor, 500 volts, revs. 725 per min. On the pump is fitted a safety valve and also water service for glands to keep slime from coming up to the packing. For this work we have a 3 x 4 in. Gould triple power pump, driven by a 5 h.p. motor 960 revs., belt driven. Outside the house is a tank 4ft. x 6ft. to supply water to the gland pump. A 4in. delivery main leads from the pump along the up-track, round the working face, and down by the return track, with T-pieces, plug-cocks, and unions for connecting up to the fire-hose with 1⅛in. nozzle. A 100ft. length for the track, and a 250ft. length for the long face of the dump is used. The residue slime pulp is by-passed to the cone-bottom tank by a pipe from the discharge main to the dam. The amount of salt to be added is hoisted up and dumped into the pulp. After being agitated for about two hours, the mixture is in a fit condition for spraying purposes. The best results are obtained by spraying on a pulp containing from 56% to 60% moisture, and made up as follows:—The residue pulp is elevated to the mixing tank averaging from 52% to 54% moisture; but the gland service also adds a certain amount of water, and so a good thick pulp is available which is efficient as a dust layer.

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* Extracts from Paper submitted at the last monthly meeting of The Chemical, Metallurgical, and Mining Society of S.A.

On May 17th, 1914, the plant was started, and for the first month trials were made with various hoses and connections, and demonstrations made to prove efficiency on a large scale. From June 10th to 13th the whole of the current face and east and west tracks were sprayed so as to get the whole of the dump under control. Orders were then given to the contractor to tip at the south-east corner and continue in short tips, filling each one finally before moving on. As soon as each tip was full it was at once sprayed, and this method was continued, the idea being to discover if one spraying was sufficient until its turn came round again. But the filling of the whole current face of the dump took seven weeks, and during the very dry season this was found to be too long a period between spraying. The point arrived at was that slime coating on exposed portions of the dump face is very effective, and may last three or four weeks, but when a portion shows signs of wear it is well to give it another treatment at once, otherwise dust will blow from this part on to other surfaces, and give rise to an amount of drift which will make the whole face bad, or rather look bad. During the dry months of August, September, and October, spraying was done about three times a week; when the winds were very bad about two hours at a time. When we get rains a good coat remains efficient for three or four weeks. Heavy rains are not at all detrimental, and steady rains improve the spraying surface. It is always more effective to spray a new tip when it is moist, or during or just after rain, as the slime has moisture to draw upon, and owing to the hydroscopic nature of the salt the cake remains moist much longer. The track requires to be sprayed more often than the current face, owing to the spragging, trampling, and general use of the track. An overturned truck or two, quickly drying, will raise dust and look bad without amounting to much in bulk. As a result of the spraying, the contractor and boys work in a perfectly clear atmosphere, instead of being in a blinding sandstorm for days when, at periods, the trucks are not visible until close to the boys. After a week-end of blizzard weather it was a usual occurrence to have to spend some considerable time clearing tracks and ballasting a line that seemed to be suspended in mid-air. This now is never necessary. Incidentally, there is much less wear and tear on trucks; machinery in the near neighbourhood must benefit, and married quarters welcome the advent of the dust spraying. The total area under control amounts to about 600,000 sq. feet. This includes the east and west flanks, which do not require much attention, as one good spray every five or six weeks keeps them in condition. The Resident Engineer must be complimented on the design and erection of such an efficient plant, and the loyal support of the cyanide foreman and cyanide staff in making this method a success must be recorded. The experiments were carried out by myself and Mr. Leyson, under the direction of Mr. Wartenweiler, of the Rand Mines Metallurgical Staff, and Mr. F. J. Trump, manager, Ferreira Deep, whose help and suggestions made it the success it is. *Appendix.*—Duty of spraying pump, about 50,000 sq. ft. per hour; cost, including salt, power, labour, etc., 6d. per 1,000 sq. ft.; spraying pump has run on an average 22 hours per week; cost of erecting plant, about £900; amount of salt used, 5% salt to dry slime; total cost per month during the six months, £25.

THE YEAR WITH THE WITBANK COLLIERY, LTD.

Increased Output—Working Profit, £79,030 Against £73,232 for Previous Year—Additions to Surface Plant—Excellent Prospects.

THE Witbank Colliery has had another excellent year. The output reached a total of 775,906 tons, being an increase of 19,274½ tons upon that of the preceding year. The quality of the company's produce has maintained its high standard. The appropriation account for the twelve months under review may be summarised as follows:—Balance brought forward from previous year, £55,358; profit realised during the year, £79,030; rents, interest and sundry revenue, £1,746; total, £138,135; less—Audit fees for previous year, £262; Government tax on profits for previous year, £2,741; capital expenditure for past year, £4,368; sundry items, £104; dividends Nos. 18 and 19 of 12½ per cent. each declared during the past year, £52,500; directors' extra remuneration, £1,500; leaving a balance of £76,658. The following items of capital expenditure have been incurred during the past year:—Buildings, £771; machinery and plant, £5,288; Rand Mutual Assurance Corporation, Ltd., and Transvaal Coal Owners' Association, Ltd., shares purchased, £622; Uitspan equipment, £11,377; total, £18,059; less—received by sale of freehold stands in Witbank township, £1,350; sundry items written off, £963—net total, £15,746. As foreshadowed in last year's report, the Johannesburg Municipality, during the year under review, brought an action for damages against the company for the sum of £14,070 9s. 2d., as the company had not been able to obtain from the plant the quality and quantity of tar which it was anticipated it should produce, in consequence of which it was impossible for the company to carry out the terms of the contract entered into with the Municipality. Since the close of the financial year a compromise has been arrived at, whereby the company agreed to pay to the Municipality the sum of £10,000 in full settlement of the Council's claim, each side to pay its own costs.

The consulting engineer, Mr. D. Wilkinson, writes:—The output of coal during the past year was 775,906 tons, showing an increase of 19,275 tons above the production of the previous year. This result is satisfactory when one takes into account the fact that, owing to the shortage of railway trucks and the January strike, the number of days worked was 274.9, or 6.3 days less than during the previous year. The shortage of railway trucks has seriously affected the regular and consequently the most economical working of the mine. The quality and width of the seam continues satisfactory at both mines. The Uitspan screening and sorting equipment was duplicated during the year, and has resulted in an increase of 25,372 tons from this section. As your manager's report indicates, a number of important additions have been made to the surface plant, all of which is now in an efficient state.

The manager, Mr. J. K. Addie, writes, *inter alia*:—WITBANK: *Machinery and Plant.*—The plant has been thoroughly well maintained, and in this department the following work was undertaken and has been completed: The erection of two 250 h.p. Babcock and Wilcox boilers, the erection of one 7in. diameter chimney stack, re-arrangement of water service and additional feed pumps, one additional 125 h.p motor for main incline haulage, one spare 30 h.p. motor for underground endless rope haulage, additional motor for fresh water service, electrical cable connection from generator to new incline transformer house. *Mine.*—Development continues to prove the seam to be of a satisfactory thickness, carrying good calorific values. Some slight trouble was experienced in the eastern portion of the mine, but results disclosed of late by development are much more favourable, and in addition to this a borehole sunk 1,000 feet in advance of the workings gave very satisfactory values. Some alterations have been made to the arrangement of the haulage system below ground. At a central station, three independent endless rope haulages are now at work. Power for lighting, hauling and pumping is now conveyed from the generator house by cable, and before long will be transmitted at 2,200 volts instead of 550 volts as at present. UITSPAN: *Machinery and Plant.*—During the period under review the screening plant has been duplicated. The new portion of the gear has been in use for some months, and has run very satisfactorily. A large steel storage tank has been erected which conserves 90,000 gallons of water for boiler use and to meet cases of emergency. A fresh water service has also been installed for domestic purposes. Electric power has been provided for this mine, transmitted by cable from the Witbank generating station. This power is now used for haulages, pumping and lighting. *Mine.*—Development, which has been well advanced, continues to prove the seam to be satisfactory both as regards quality and thickness. Since the electrification, a powerful geared three-throw pump has been installed at a suitable central position. This pump is more than capable of dealing with all mine water.

London Base Metal Quotations.

The following are the latest (December 8) commercial quotations on the London Metal Exchange:—Standard copper, £55 7s. 6d. per ton; electrolytic copper, £59 per ton; Straits tin, £148 5s. per ton for cash, and £145 per ton for three months' delivery; English lead, £19 per ton.

TECHNICAL EDUCATION ON THE RAND.

Johannesburg Trades School Function—Interesting Speeches—What Youth Should Do—The Colour Question and Technical Training.

The annual prize distribution of the Johannesburg Trades School took place in the school's recreation hall this week, before a large attendance of pupils and their parents, while many interested citizens were also present. Mr. C. F. Stallard, K.C., chairman of the managing body, presided over the function, and among those present were Professor J. E. Orr (vice-chairman), Messrs A. B. Linscott (principal of the school), T. W. Horne (organiser of Technical Education in the Transvaal), R. Raine (president of the Mine Managers' Association), T. Clark, J. T. Brown (secretary of the National Federation of Building Trade Employers), John Wevell (chairman of the Trades Section of the Chamber of Commerce), and Dr. Manfred Nathan. The Chairman, in the course of a few appropriate remarks, referred to the importance of the school, emphasising that in no way could youth play a more important part in the economic development of the country than by becoming skilled and competent as tradesmen. It was worth a lot to have their children so educated that they could take their places in the skilled ranks and not fall into the ranks of the unskilled and perhaps unemployed. The coloured and black man to-day, he emphasised, were treading very closely on the heels of the white man in the industrial field, and only by securing for the white children real, sound, efficient technical training could they hope to beat the coloured industrialist. Far be it from him to urge anything like antagonism between white and black, but it would be a shame to their civilisation and to them individually if the white races were to fall behind in the struggle. Proceeding, Mr. Stallard said that there were eighteen evening classes with an average attendance of 50. In concluding, Mr. Stallard paid a tribute to the principal and his staff and also to the sub-committee of the governing body, which had endeavoured to obtain the views of employers and trade unions in regard to the school. The Principal of the school (Mr. Linscott) made a few remarks, in the course of which he pointed out that since the starting of the school they had had 169 boys on their books, of whom 89 were still with them, while 10 were on active service, and Mr. Stallard had accounted for another 11. Of the others many had not come with the intention of going through the full course. Of the 11 who had gone out, 8 had gone to the mines, and none had gone at less than 6s. per day. After the distribution of the prizes by the chairman, Professor Orr asked the audience to wish prosperity to the school. Mr. Clark, in a few words, urged the boys to show that they were superior in intelligence and brain to the black and coloured man.

IS THE VALUE OF THE RAND DECREASING IN DEPTH?—I.

Mr. T. A. Rickard Re-introduces Discussion Before the I. of M. & M.—Facts vs. Theories—Mr. H. F. Marriott Challenged.

Before the Institution of Mining and Metallurgy in mail week, Mr. T. A. Rickard read a lengthy paper on the Persistence of Ore in Depth, from which we take the following:—

As I have already suggested, those who believe in the persistence of ore in depth should enjoy a large perspective, and open up their mines on a grandiose scale. To sink a couple of hundred feet and then commence to stope a lode that is believed to continue rich indefinitely downward is puerile engineering. It is fair to say that to any such charge the men of the Rand can plead "not guilty." Those who started the big-scale exploitation of the Main Reef series were true to their quasi-geological convictions, and designed the development of their mines in a manner entirely consistent. The doctrine preached on the stock exchanges of Johannesburg and London, ten years ago, was that the beds of gold-bearing conglomerate had the uniformity of a coal seam, and would continue profitably productive to a depth beyond human reach. At that time the leading engineers of the Rand were discussing projects for tapping the Main Reef series at vertical depths ranging from 5,000 to 8,000 feet, the latter figure taking it for granted that profitable "banket" would extend to 18,000 feet on the dip. At that time I ventured to protest against such flouting of world-wide experience in mining, and wrote a leading article under the sardonic title of "Even Methuselah Died."* Since that was published the irrefutable logic of facts has been ignored persistently by those responsible for the direction of mining affairs in South Africa, with the exception of one or two perspicacious engineers, whose utterances have been disregarded. In 1907 Frederick Hellmann testified before the Mining Industry Commission, at Johannesburg, that a decrease in the grade of the ore was "most marked" in "all mines" with which he was acquainted on the Rand. He added that in the Driefontein this impoverishment was especially noteworthy. Mr. Hellmann was then general manager of the East Rand Proprietary. Nevertheless, in March, 1910, Sir George Farrar and Sir Lionel Phillips testified to the shareholders of the East Rand Proprietary that the Angelo Deep† had "added to the evidence that the Witwatersrand series were not decreasing in value" in depth, and Sir Lionel Phillips asserted that "if they excluded the surface area down to 200 or 300 feet, there seemed to be no evidence whatever that the gold contents at the deepest levels were not fully as high as they were at the surface, or within 300 feet of the actual surface." This statement is confused, but its general intent is plain enough; it is in direct contradiction to the ex-manager's testimony, which must have been known to both of these directors. In the following year, before the Institution of Mining and Metallurgy, a reference to the subject, in a paper by C. O. Schmitt, provoked H. F. Marriott, consulting engineer to the Central Mining Corporation, to state that "the assay values of samples of actual reef-widths taken throughout all the mines" of the group controlled by his employers showed "no substantial evidence" of general deterioration in the richness of the ore with increasing depth. I referred to this assertion editorially in "The Mining Magazine,"‡ and laid stress on the importance of furnishing the proof of it, in the interests alike of economic geology, the mining industry, and the share-market. Obviously, if Mr. Marriott had "made good" it would have been to the interests of everybody concerned. He did not accept the challenge. It is fair to assume that he had not the facts to support his assertion. And now, since I began§ to prepare this paper, comes the annual report of the Consolidated Gold Fields of South Africa, for the year ending June 30, 1913, with an admission by H. H. Webb, that "there can be no doubt that from our experience and in our mines the average value of the ore developed over large areas has been getting lower as greater depth is attained. High-grade areas and patches are encountered in depth, but these are not as frequent or extensive, nor are they in all cases as high in value, as they were near the outcrop, consequently the general average over large areas has fallen." No one now connected with Rand mining is in a position to speak with greater authority than Mr. Webb. It is evident that Methuselah is going the way of all flesh. The deepest mines on the Rand are the Jupiter, 5,040 feet, the Cinderella Consolidated, 4,627 feet, the Simmer Deep, 4,780 feet, and the Village Deep, 4,245 feet. Of these, the first two are idle, for the sufficient reason that it is unprofitable to operate them. The Simmer Deep is struggling with an ore so low grade as to warrant the prediction that it also will be shut down at an early date. The Village Deep is still a profitable mine, but the ore it produces is not as rich as that of the Ferreira Deep, which is above it on the dip, and considerably less rich than that yielded by the Ferreira and Wemmer, which were the corresponding outcrop mines. By way of comparing outcrop and deep-level mines, that is, shallow and deep properties in vertical succession, I may quote the Geldenhuis, Geldenhuis Deep, and Jupiter series; or the Bonanza, Robinson Central Deep, and the Robinson Deep. Surely the mention of these is enough to give pause to the unscientific optimist. They represent facts to which the promoters of the Rand have tried to shut their eyes for many years, but they can no longer be ignored by the members of our profession.

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* "Engineering and Mining Journal," May 2, 1903.

† One of the mines included in the East Rand Proprietary.

‡ in the issue of August, 1911, p. 98, and in that of November, 1911, p. 341.

§ Early in November, 1913.

Nigel G.M. Co.

The returns from this company's mine for the month of November are as follows:—Profit, £3,498.

New Kleinfontein.

Details of the operations of the New Klainfontein for November are as follows:—Stamps, 200; days run, 28·174; tube mills, 4; tons milled, 47,850; gold recovered, 15,740·829 fine ozs.; net value, £66,005 11s.; profit, £22,163 9s. 9d.; working costs (excluding development), 16s. 9·278d.; development to working costs, 1s. 6·619d.; total working costs, 18s. 3·897d.; capital expenditure, £1,798 17s. 8d.; maintenance expenditure upon Apex and Benoni sections, £1,026 3s. 9d.

SOUTH AFRICAN MINING SHARE MAKING-UP PRICES.

Official List for 27th July in Connection with the Emergency Rules of London Stock Exchange.

Afric. and European Invst. ..	$\frac{5}{16}$
Afric. City Props. Tst. Ord. ..	$\frac{19}{32}$
African Farms	11
Afric. Freehd. Coal Ld. Ord. ..	1/–
Afrikander Proprietary	$\frac{1}{8}$
Alaska Mexican	$1\frac{1}{4}$
Alaska Treadwell	$8\frac{5}{16}$
Alaska United	$3\frac{3}{8}$
Amal. Props. of Rhod. (1913) ..	1/9
Anglo-French Explor.	$\frac{11}{16}$
Anglo-French Matabeleland ..	1
Antelope (Rhodesia)	2/6
Apex	$\frac{13}{16}$
Auckland Park Real Estate ..	$\frac{7}{16}$
Aurora West United	$\frac{7}{16}$
Bantjes Consolidated	$\frac{23}{32}$
Bechuanaland Exploration ..	5/6
Beira Rail. Bearer Certs. (B.S. Africa Co.)	1
Do. (Cie. de Mocambique) ..	$\frac{13}{16}$
Do. (Reg.)	1
Do. $4\frac{1}{2}$ p.c. Mort. Debs. ..	90
Do. 6 p.c. Income Deb. Stk.	89
Beira Junction	3/9
Belingwe Gold Reefs	2/3
Blaauwbosch Diamonds	$4\frac{5}{8}$
Brakpan Mines	$2\frac{21}{32}$
Breyten Collieries	$1\frac{3}{\text{[illegible]}}$
Brit. Central Africa Co. ..	4/3
Brit. East Africa Co. Ord. ..	$\frac{15}{32}$
Brit. S. Af. Co. (Chartered) ..	14/3
Bucks Reef Gold Mines	1/–
Bul. and Gen. Explor. (1906) ..	2/3
Bulawayo Syndicate	5/9
Bulawayo Water	3/–
Burma Ruby	2/6
Bwana M'Kubwa Copper M. ..	2/3
Cam and Motor Gold Mng. ..	19/6
Cassel Coal Co.	$\frac{3}{4}$
Cent. Ming. & Invest. Corp. ..	$7\frac{7}{8}$
Charter Tst. & Agency Ord. ..	74
Do. 5 p.c. Pref.	88
Charterland & Gen. Expln. and Finance	1/9
Chicago-Gaika Development ..	4/6
Cinderella Consolidated	6/3
City and Suburban	$2\frac{5}{8}$
City Deep	$3\frac{1}{8}$
Cloverfield Mines	4/3
Clydesdale (Transvaal) Coll. ..	$\frac{1}{2}$
Consolidated Bultfontein.. ..	$1\frac{1}{4}$
Consol. Gold Field of S.A. ..	$1\frac{31}{32}$
Do. 6 p.c. Pref.	19/–
Do. 6 p.c. 2nd Pref.	16/–
Consolidated Langlaagte ..	$1\frac{11}{16}$
Consol. Main Reef Mines and Estate	$\frac{29}{32}$
Consol. Mines Selection	8/6
Coronation Syndicate	$\frac{7}{32}$
Crescens (Matabele) Mines and Land	8/6
Crown Mines	$5\frac{7}{8}$
Daggafontein Gold	$\frac{5}{16}$
Daggafontein Prosp. Synd. ..	$\frac{1}{2}$
De Beers 40 p.c. Cum. Pref. (Bearer)	$15\frac{1}{2}$
Do. do. (Registered)	—
Do. Deferred (Bearer)	$14\frac{11}{16}$
Do. do. (Registered)	—
Delagoa Bay Develpt. Corp. ..	6/9
Diamontfontein Dev. Synd. ..	6/6

Durban Roodepoort	1
Durban Roodepoort Deep ..	$\frac{15}{16}$
Dwarf Gold Mining	6d.
East Rand Central	2
East Rand Deep	$\frac{1}{16}$
East Rand Extension	1
East Rand Gold Coal & Est. ..	1/–
East Rand Mining Esates ..	5
East Rand Proprietary	$1\frac{25}{32}$
Eastern Gold Mines	1/–
Eileen Alannah Mining Co. ..	$\frac{1}{2}$
Eldorado Banket Gold Mng ..	$\frac{3}{4}$
Enterprise Gold Mg. & Est. ..	8/–
Exploration Company	$\frac{7}{16}$
Exploring Land & Minerals ..	2/6
Falcon Mines	$\frac{3}{4}$
Farm Lands of Rhodesia ..	8/–
Ferreira Deep	$2\frac{1}{4}$
Frank Smith Dia. Est. and Exlpn	2/9
French Rand Gold Mining ..	9d.
Gaika Gold..	$\frac{11}{16}$
Geduld Proprietary	1
Geldenhuis Deep	$1\frac{1}{4}$
General Mining & Fin. Corp. ..	8/6
Giant Mines of Rhodesia ..	$\frac{19}{32}$
Ginsberg	$\frac{3}{4}$
Glencairn Main Reef	2/6
Globe and Phœnix	$1\frac{21}{32}$
Glynn's Lydenburg	$\frac{9}{16}$
Goerz and Co.	1
Gold Field Rhod. Develp. ..	10/–
Gold Field Investment	$\frac{5}{8}$
Govt. Gd. Mg. Areas (Modderfontein) Consolidated	$1\frac{7}{32}$
Harmony Proprietary	1/–
Hay Gold Mining	4/–
Henderson's Transvaal Est. ..	3/6
Heroit (New)	$3\frac{1}{8}$
Hollinger Gold Mines	$3\frac{7}{8}$
Hudsons' Consolidated	$\frac{1}{4}$
Indimba Tin Alluvials	5/3
Johannesburg Cons. Inv. ..	19/–
Johannesburg Estate	3/9
Johannesburg Gold Fields ..	2/–
Jumbo Gold	1/3
Jumpers	$\frac{3}{16}$
Jupiter Gold	$\frac{7}{32}$
Kamfersdam	$\frac{13}{32}$
Kleinfontein (New)	$1\frac{3}{16}$
Klerksdorp Proprietary	$1/7\frac{1}{2}$
Knight Central	$\frac{11}{32}$
Knights (Wit) Gold	$3\frac{7}{16}$
Knights Deep	$1\frac{5}{8}$
Koffyfontein Mines	$1\frac{9}{16}$
Langlaagte Estate..	$\frac{15}{16}$
Lomah (Rhod.) Exp., all pd. ..	1/–
London and Rhod. M. & L. ..	$\frac{21}{32}$
London Wall Trst, 15/– pd. ..	$\frac{3}{4}$ dis.
Lonely Reef Gold Mining ..	$1\frac{5}{16}$
Luipaard's Vlei	11/–
Lydenburg Estates	3/6
Lydenburg Gold Farms	$\frac{1}{8}$
Lydenburg (Trans.) G. Exp. ..	2/–
M. F. Exploration Co.	$\frac{1}{4}$
Main Reef West	$\frac{7}{16}$
Mapeke Mines	1/–
Mashonaland Agency	6/–
Mashonaland R. 5 p.c. 1st Mt. Debs.	86
Do. 5 p.c. Gua. Mt. Db., 1905	$99\frac{1}{2}$
Matabele Queen's Co.	$\frac{3}{16}$

May Consolidated	5/6
Mayo (Rhod.) Devel., 1908 ..	$\frac{11}{16}$
Messina (Trans.) Devel.	$\frac{23}{32}$
Meyer and Charlton	$5\frac{7}{8}$
Middelburg St. Cl. and Ck. ..	$\frac{7}{8}$
Do. Pref.	$\frac{5}{8}$
Moçambique (Comp. de) ..	13/3
Modderfontein B	$4\frac{5}{16}$
Modderfontein New	$13\frac{1}{16}$
Modderfontein Deep Levels ..	$2\frac{15}{16}$
Montrose Diamond Mining ..	1/–
Montrose Exploration Co. ..	3/–
Moodie's	2/–
Murex Co.	1/6
Natal Navig. Coll. and Est. ..	$\frac{3}{4}$
New African	13/3
New Boksburg	/6
New Districts Develop. Co. ..	10/6
New Eastern Invest. Co. ..	2/6
New Era Co.	$\frac{9}{32}$
New Found Out Mines	3/9
New Geduld Deep	$\frac{1}{8}$
New Goch Gold	$\frac{23}{32}$
New Jagersfontein M. and Exp. (Bearer)	$3\frac{9}{16}$
New Primrose	$\frac{31}{32}$
New Rhodesia Mines	9
New Unified Main Reef	$\frac{7}{8}$
New United Reefs (Sheba) ..	3
New Vaal Riv. Dia. & Exp. ..	$1\frac{1}{8}$
Nigel Gold	$\frac{1}{2}$
Nile Valley	1/–
North Chartered Exp. Co. ..	$\frac{1}{8}$
Northern Copper (B.S.A.) ..	5/3
Nourse Mines	$1\frac{3}{8}$
Oceana Consolidated	4/9
Oceana Development	1/9
Orange F. St. & Trans. Dia. ..	1/6
Oriental Cons. M. Cap. Stk. ..	$1\frac{1}{2}$
Pigg's Peak Development ..	8/9
Planet-Arcturus Gold Mines ..	$\frac{3}{8}$
Potchefstroom Exp. & Min. ..	9
Premier Exploration Co. ..	3
Premier (Trns.) Dia. Cm. Pf. ..	$8\frac{1}{4}$
Do. Def.	$6\frac{5}{8}$
Princess Estate and G.M. ..	5/–
Rand Mines	$5\frac{13}{16}$
Rand Collieries	$\frac{1}{8}$
Rand Klip	3/–
Randfontein Central	$\frac{27}{32}$
Randfontein Deep	$\frac{3}{16}$
Randfontein Estates	$\frac{21}{32}$
Read's Drift	$\frac{3}{8}$
Rezende	$1\frac{1}{16}$
Rhodesia, Ltd.	1/3
Rhodesia Broken Hill Dev. ..	1/–
Rhodesia Consolidated	2/–
Rhodesia Copper	2/–
Rhodesia G.M. and Inv. Co. ..	$\frac{13}{32}$
Rhodesia Rys 4 p.c. Debs. ..	$84\frac{1}{2}$
Do. 5 p.c. Debs.	94
Rhodesia Railways Trust ..	$\frac{13}{16}$
Rietfontein (New) Est. Gld. ..	3/6
Roberts Victor Diamond ..	$\frac{3}{4}$
Robinson Gold	$2\frac{7}{8}$
Robinson Deep	$1\frac{1}{2}$
Roodepoort Un. Mn. Rf. G. ..	$\frac{3}{8}$
Rooiberg Minerals Dev. Co. ..	$1\frac{3}{16}$
Rose Deep	$2\frac{1}{8}$
Sacke Estate	3/3
Scottish Mashonaland	4/3

Selukwe Columbia Gold M.	1/9
Selukwe Gold Mining	1/-
Shamva Mines	$2\frac{3}{16}$
Sheba	4/6
Simmer and Jack Proprietary	$\frac{17}{32}$
Simmer Deep	1/9
South African Copper Trust	9d.
South African Diamond Corp.	$1\frac{3}{8}$
South African Gold Mines	$\frac{19}{32}$
South African Gold Trust	$\frac{7}{8}$
Do. Pref.	16/-
South African Land & Explor.	$\frac{1}{8}$
South African Territories	3/9
South West Africa	18/6
Springs Mines	$\frac{11}{16}$
Do. (Bearer Option Certs.)	2/3
Steyn Estate (New)	$\frac{7}{16}$
Sub Nigel	$\frac{1}{2}$
Surprise Gold	2/6
Swazieland Corporation	1/3
Tanganyika Concessions	$1\frac{13}{16}$
Do. 5 p.c. Debs.	$5\frac{3}{8}$
Tarry, E. W. Ord.	$\frac{3}{4}$
Do. 6 p.c. Cum. Pref.	$\frac{13}{16}$
Tati Co. (18/9 paid)	4/3
Thistle-Etna Gold Mines	$\frac{3}{16}$
Toronto (Rhodesia) Synd.	2/6
Trans. and Delagoa Bay Inv.	$2\frac{7}{16}$
Trans. and Rhod. Estates	2/-
Transvaal Coal Trust	$1\frac{5}{8}$
Trans. Cons. L. and Explor.	$\frac{29}{32}$
Trans. Estate and Develop.	7/9
Trans. Explor. Ld. & Min.	$1\frac{1}{2}$d.
Transvaal Gold M. Estates	$2\frac{1}{16}$
Trust & Agc. Assets Deb. S.	4/-
Tweefontein Colliery	1
Union and Rhodesian Tst.	2
United Rhodesia Gold Fields	2/-
Van Dyk Proprietary	9d.
Van Ryn	$2\frac{15}{16}$
Van Ryn Deep	$2\frac{11}{32}$
Vereeniging Estates	$\frac{11}{32}$
Victoria Falls & Trans. P. Pf.	$\frac{23}{32}$
Village Deep	$1\frac{15}{16}$
Village Main Reef	$1\frac{15}{16}$
Vogelstruis Consolidated Deep	6d.
Vogelstruis Estate & Gold	2/3
Wanderer (Selukwe)	2/9
Wankie Colliery Co.	$1\frac{1}{8}$
Welgedacht Exploration	$\frac{9}{16}$
West Rand Central	$\frac{1}{32}$
West Rand Consolidated	6/3
Do. 6 p.c. 1st Mort. Debs.	82
Western Rand Estates	$\frac{1}{8}$
Willoughby's Consolidated	7/9
Witbank Colliery	$2\frac{1}{8}$
Witwatersrand Deep	$2\frac{3}{8}$
Witwatersrand Township Estate and Finance Corp.	$\frac{3}{4}$
Wolhuter	$\frac{3}{4}$
Worcester	$\frac{7}{8}$
Zaaiplaats Tin Mining Co.	$1\frac{1}{4}$
Zambesia Exploring Co.	11/9
Do. Option Certs. 1915 Reg.)	1/6
Do. $5\frac{1}{2}$ p.c. 1st Mt. Debs. (Reg.)	80

EXCELLENT OUTLOOK FOR THE BREYTEN COLLIERIES.

Dividends Increased and Capital Expenditure Written Off—Mr. C. D. Leslie's Report on the "Coal in Sight."

Each year that goes by sees the financial position of the Breyten Collieries strengthened, and the supply of coal in sight at the mine further extended. For the twelve months ended October 31 last the profit amounted to £23,554 (against £27,468 for the preceding year), which, added to the credit balance at 31st October, 1913, of £7,500, makes a total of £31,055. Out of this there has been distributed in respect of dividend No. 2 £9,000, and Dividend No. 3 £4,500; and appropriated to reserve account from profits and applied to meet capital expenditure, £11,354; leaving a balance at credit of appropriation account at 31st October, 1914, of £6,200. Mr. C. D. Leslie, the Superintending Engineer, in his annual report, writes:—

The total tonnage mined during the period amounted to 467,558 tons, as compared with 474,744 tons for the previous year, or a decrease of 7,186 tons. The segregation of the tonnage mined is as follows:—From No. 1 mine, 33,163 tons; from No. 2 mine, 250,957 tons; from Nos. 3 and 5 mines, 68,215 tons; from No. 4 mine, 115,223 tons; total, 467,558 tons. During the year the coal which it was convenient to mine through Adits Nos. 1 and 4, which adjoin each other, was practically exhausted. Most of No. 1 Adit workings are confined between the main water-course which forms their north-west boundary and the main fault which divides their eastern boundary from the upthrown area commanded by No. 4 Adit. No. 4 Adit workings were advanced to a washed-out area on the east and north-east, and were abandoned because the area beyond the "wash out" can be mined more economically in the future through No. 2 Adit. The total tonnage abstracted from No. 1 workings has amounted to 490,000 tons, and about 185,000 tons were taken from No. 4 workings. The workings of Adits Nos. 2 and 3 were advanced eastwards to a north and south dyke which has been intersected at several points. The workings east of this dyke indicate the presence of a large area of excellent, clean coal, of a favourable width for mining. No. 5 Adit has been driven south-eastwards for a total distance of 952 feet, and though the coal there is not yet up to standard, it is hoped that an improved section will be reached, because this adit is being advanced in the direction of the old river workings, from which your company, in its earlier stages, mined coal of excellent quality. No. 6 Adit is being opened out to mine a comparatively small upthrown area situated between No. 5 and No. 3 workings. The coal here is clean and of favourable width for mining, and analyses of it show values somewhat above the average. The areas opened out so far by the various adits enumerated comprise, collectively, a comparatively small part of the eastern portion of your large property, and I consider it safe to say that there is now more coal in sight than at any time in the previous history of these collieries. During the year a certain amount of borehole prospecting was done in the neighbourhood of the main plant, which is situated west of the present workings, but the results were unsatisfactory, possibly because the small shot drill used did not give a solid core. In the large central area, further south, coal was encountered in a borehole, and near this borehole a small prospecting shaft is being put down to get some idea as to the width and value of the seam. Your manager, Mr. W. H. Lewis, has shown great skill in working your collieries during the past year, notwithstanding the many difficulties which have arisen, due partly to industrial troubles which were common to the mining industry generally; and the various members of his staff have worked most enthusiastically with him to secure the best possible results.

Germany Tries to Sell Diamonds in the States.

A special correspondent of the *Financial News* in New York sends the following interesting information:—"German agents recently arrived here with the object of endeavouring to sell a large parcel of diamonds. Attempts were made in every direction where the possibility existed of doing business, and there was no fixed restriction as to price. These agents were empowered to negotiate the sale of 500,000 carats of rough diamonds. The presumption is that the parcel was a portion of the stock of South-West African goods held by the German Diamond Régie in Berlin. On account of this attempt to dump a large quantity of stones here the little diamond trade which was in existence has entirely disappeared, and it is not expected that any business will be done until after the war." Independent inquiries confirm the correctness of the above despatch. It shows unmistakably one thing—the need of money by the German Government and the frantic efforts that are being made to raise it. No business corporation managed by sane men would, in the present condition of affairs, attempt to force a large parcel of diamonds—a luxury which at the present time even the rich refrain from buying—on the market. The action of the German Government is in itself a miserable confession of weakness. In the ordinary way these stones would have been turned into brilliants on the Continent. Sending them to the States is futile. In the first place, the Americans prefer a higher class of goods than those produced in German South-West Africa; while in the second place the small American cutting industry which is in existence is not mechanically prepared to deal with stones of less than a carat in weight, and the 500,000 carats offered are "smalls." Tempting as the business may have been to the American dealers, it was refused. There is no other avenue open for selling; so that the £750,000, or even £500,000, which it was expected to raise, will not materialise.

Knight Central.

In the quarter ended the 30th of September the Knight Central made a profit of £12,[illegible] 4s. 3d., equal to 3s. 2·[illegible]d. per ton. The total cost came to £75,[illegible] [illegible] or [illegible] 7·67d., and the revenue from gold £88,796 17s. 11d.

CONSOLIDATED GOLD FIELDS ANNUAL REPORTS.

Points from Annual Reviews by General Managers—Authoritative and Exhaustive Presentation of the Industrial Features of the Year—New Legislation—The Outlook.

In the course of their annual report, the joint general managers of the Consolidated Goldfields of South Africa write :—It is to be regretted that the uninterrupted progress of the Witwatersrand gold mines, to which we have been accustomed to call attention, was not maintained during the twelve months ended the 31st July, 1914, the figure showing an output of 7,942,349 fine ounces of gold, representing an estimated profit of £11,630,000, as compared with 8,698,681 fine ounces and £12,750,000 respectively for the previous year. The causes contributing to the decrease are to be found mainly in the industrial disturbances which have occurred during the period under review. In the last report reference was made to the miners' strike in July, 1913. This was followed, in January last, by a strike of employees of the South African Railways, when the Transvaal Federation of Trades Unions called a general strike in sympathy therewith. The mine employees, who put forward no grievances, only partially responded to this call; so operations on the gold mines were not seriously interfered with, except that the January strike added to the unsettled state of the native mind caused by the disturbances in July, 1913, which no doubt largely accounted for the severe shortage of labour during the latter part of the year 1913 and the early part of 1914.

YIELD AND WORKING COST.

In previous reports it has been pointed out that, taking the Witwatersrand gold mining industry as a whole, the recovery values per ton crushed have, of late, shown comparatively little variation from year to year, so that any increase in the average rate of profit earned must generally be derived from a reduction of working costs. The figures for the three years ending 31st July, 1913, were :—1911, recovery 27s. 10d., working costs 17s. 10d., profit 10s.; 1912, recovery 28s. 1d., working costs 18s. 5d., profit 9s. 8d.; 1913, recovery 27s. 9d., working costs 18s. 1d., profit 9s. 8d.; whereas they were for the year ended 31st July, 1914, recovery 26s. 10½d., working costs 17s. 6d., profit 9s. 4½d. It will thus be seen that, for the past year, as compared with the previous year, the recovery shows a drop of 10½d. per ton, and working costs a reduction of 7d. per ton, with the result that the net profit per ton crushed shows a decrease of 3½d. As regards the drop in grade, allowance should be made for the fact that, when there is a shortage of labour, hand stoping must to a large extent be replaced by machine stoping, and, as the small machine drills have not, so far, been sufficiently perfected to allow for as clean stoping as can be carried out by the former method, the grade of ore sent to the mill is adversely affected With regard to working costs it is satisfactory to be able to record that, in spite of the industrial disturbances and the subsequent shortage of labour, the industry as a whole has been able to show a reduction. Our own group suffered in like manner with other groups, and more especially so in that the Jupiter Mine has had to close down temporarily owing mainly to the extreme shortage of native labour and for other reasons which were fully dealt with in a circular issued in October, 1913, by that company to its shareholders. Leaving out the Jupiter and taking the other five crushing companies under the management of the Consolidated Gold Fields, the tonnage crushed during the year under review shows a decrease of 333,922 tons as compared with the previous year, whilst there is a drop in grade of .155 dwt., equal to, say, 7¾d. per ton crushed. Working costs show an increase of 6.780d. per ton crushed. An increase in working costs was inevitable in view of the large reduction in the tonnage crushed, due to reasons already given. It has, however, to be noted that, for our crushing mines on the Rand, the average working costs were 13s. 6.905d. per ton crushed; as compared with 17s. 6d. for the whole of the Witwatersrand, or 18s. 1d. if our companies are excluded and the working costs of the remaining mines on the Witwatersrand taken.

THE WAR AND THE INDUSTRY.

Whilst the results obtained for the year ending July, 1914, do not compare favourably with those of 1913, signs are not wanting that, with the increased native labour supply, industrial peace and rest from undue and unfair agitation, recent results might be improved upon in the near future should operations not be seriously interfered with in consequence of the war. It has, however, to be remembered that, with practically all industries on the European Continent at a standstill, the cost of securing the stores and commodities essential to mining operations will probably be appreciably greater owing to the increase in freight charges and, in many cases, in the prices of raw material.

NATIVE LABOUR.

The native labour position has materially improved since December, 1913, when the number employed on the Witwatersrand gold mines amounted to only 151,538, the lowest figure for unskilled coloured labourers that has obtained on these fields since January, 1907. By July, 1914, the native labour force had reached 170,407, and seems likely to increase still further. The Native Recruiting Corporation, which was formed two years ago in order to end a disastrous competition amongst the various groups in recruiting natives in British South Africa (a competition which not only increased the cost of obtaining labour, but also unduly raised the wages), has justified its formation. It is true that the anticipated reduction in the cost of recruiting natives has not yet been attained, but, in view of the results obtained in spite of the difficulties experienced during the industrial disturbances, when all recruiting was temporarily stopped by the Government, there are good grounds for thinking that a material reduction will be effected very shortly. It is also satisfactory to find that the Corporation is steadily bringing about an equal distribution of labour, which is most desirable, as the organisation of a mine is much upset when large fluctuations occur in the number of boys employed. By maintaining the percentage of the complement at each mine at about the same figure, the chances of any large fluctuations are considerably reduced. The following figures show how severely our mines suffered on account of the diminution in the native labour supply after the July disturbances, and on account of the repatriation of tropical boys. The figures represent the total number of boys employed on the Gold Fields crushing mines (excluding Jupiter) in June, 1913, January, 1914, and July, 1914 :—

	Total Complement.	Natives Employed.	Percentage of Complement.
30th June, 1913	23,526	16,491	70.10
31st January, 1914	23,663	13,025	55.04
31st July, 1914	23,535	15,055	63.97

The number of Tropical natives employed in July, 1914, by members of the Witwatersrand Native Labour Association was 4,550, as compared with 18,320 for July last year, whilst on the Gold Fields mines for the same months the figures were, respectively, 529 and 3,204. On the 31st of July, 1913, Mr. H. O. Buckle, the Chief Magistrate of Johannesburg, was appointed by the Government as a Commissioner to investigate the conditions under which natives are engaged and employed on these fields. Mr. Buckle, in his report, has suggested a number of reforms which might be carried out by the industry as a whole. but which exist already on many mines. It is encouraging to note, from this report, that since Mr. Buckle entered upon the enquiry, he was "astonished to learn how much care and thought are expended upon the native labourer's health and comfort; and that all witnesses with any long experience of the mines—including every class and colour—are absolutely unanimous in the assertion that the improvement in the conditions of the native labourer on the Rand has been enormous and continuous."

QUESTION OF HYGIENE.

The matter of the health of all employees on the mines continues to receive every consideration. The erection of the buildings of the South African Institute of Medical Research is now almost completed, the total cost of same being some £42,000, which has been borne by the mining industry. The Institution has invited a mission of two experts from the Rockefeller Institute to study pneumonia on the Rand. Mention was made last year of Sir Almroth Wright's investigation into the question of pneumonia among natives on the Witwatersrand. The Transvaal Chamber of Mines has now received the final report. The recommendations contained therein are being followed and the investigations continued. In view of the conspicuous success attained by Surgeon-General Gorgas in the administration of sanitary arrangements in the Panama Canal zone, the Transvaal Chamber of Mines invited him to visit the Witwatersrand to advise on the general health conditions prevailing on the mines. General Gorgas, in December last, after three months' investigation, made a report containing various suggestions which he considers, if given effect to, will bring about improvements. Certain experimental work is being carried out on the lines suggested. The total cost to the mining industry in connection with the visits and investigations of Sir Almroth Wright and Surgeon-General Gorgas amounted to £22,544.

NEW LEGISLATION.

During the last session of the Union Parliament an Act amending the Miners' Phthisis Act, 1912, was passed, which provides for the payment of additional compensation to miners suffering from the first stages of the disease who became beneficiaries prior to August 1st, 1914. The immediate result of this new provision has been to increase the amount which the mining companies have to defray. Provision is also made in respect of future applicants suffering from the first stages of the disease (known as Class A men) for a more liberal allowance than under the principal Act, but any increase in the amounts of compensation to be paid in this connection may be counterbalanced by fewer men coming under Class B, which entitles applicants to claim the maximum compensation. The amending Act also provides for greater benefits to the dependents of natives dying from miners' phthisis. It is impossible to estimate what the cost to the industry will be on account of this further provision. There has been no relaxation on the part of the industry in its efforts to find means of eliminating this disease. A committee, known as the Miners' Phthisis Prevention Committee, on which are represented the Government, the gold mines, and the miners, with the Government Mining Engineer as chairman, sits regularly to consider and discuss suggestions for improvements, and the work of this committee has been of great value. In connection with the matter of dust allaying, which is referred to in the Superintending Engineer's report, the Transvaal Chamber of Mines has appointed a standing sub-committee consisting of three engineers, together with a suitable staff. The work of this committee includes the sampling of the air of each mine on the Witwatersrand periodically with a view to seeing that the work of eliminating dust is being carried out satisfactorily, and it is encouraging to note that the results show continued improvement. There is every reason to hope that these sustained efforts are likely to result in a great diminution in the number of men affected. Since the compensation and insurance funds were established under the Miners' Phthisis Act of 1912, which came into operation on 1st August, 1912, the following amounts have been paid out by our companies :—

	To Compensation Fund.	To Insurance Fund.	Total.
Year ended 31st July, 1913	£24,208 9 10	£10,667 14 11	£34,876 4 9
Year ended 31st July, 1914	33,495 11 1	8,338 6 5	41,833 17 6
Making a total of ...	£57,704 0 11	£19,006 1 4	£76,710 2 3

During the same periods our companies have spent in precautionary measures and appliances, and also on the Miners' Phthisis Sanatorium, the following sums :—

Dust allaying	£48,334 17 5
Ventilation underground	14,834 13 3
Contribution to maintenance and capital cost of Miners' Phthisis Sanatorium	1,595 4 2
Total	£64,764 14 10

Equal to a total expenditure for the two years in question of £141,474 17s. 1d. In order to economise native labour, continued attention is given to improving the efficiency of the native and to mechanical improvements, and it would appear from the following comparative figures that a measure of success is attending these efforts. The figures refer to gold mining companies which are members of the Witwatersrand Native Labour Association :—First six months of 1913 : Average tons hoisted per month, 2,547,082 ; average number of natives employed, 201,108 ; tons per native per month, 12.66. First six months of 1914 : Average tons hoisted per month, 2,269,365 ; average number of natives employed, 161,896 ; tons per native per month, 14.02 ; number of natives that would have been required on the basis of the first six months of 1913, 179,254 ; saving due to increased efficiency and mechanical improvements, 17,358.

Bewaarplaatsen.—The Government did not during the last session of the Union Parliament introduce the Bill providing for the payment of half of the proceeds to the freehold owners of the Bewaarplaatsen and Water-right areas leased or sold by the Government. During the last session of the Union Parliament several Acts were placed on the Statute Book affecting the gold mining industry, the more important among them being :—

Miners' Phthisis Act Amendment Act, 1914, already referred to.

Workmen's Compensation Act, 1914.—This Act takes effect from the 1st January next, and is a consolidating measure repealing the existing laws in the various Provinces. The Act is no doubt an improvement on the existing laws, and will certainly tend to promote smooth working, and is not likely to increase materially the burdens of the mining industry.

The Rand Water Board Supplementary Water Supply (Private) Act, 1914.—Last year reference was made to the adoption of a permanent scheme for obtaining water from the Vaal River in order to ensure an adequate supply for industrial, domestic, and other purposes. The enabling Act was duly passed during the last session of the Union Parliament, and gives the Board authority to raise a sum of not exceeding £1,250,000 for constructing a barrage or dam across the bed of the Vaal River, near Vereeniging, and to store surplus water. The reservoir will impound 13,633,000,000 gallons of water, of which the Board may take 20,000,000 gallons per day. It is estimated that the completion of this scheme will take four years from date of commencement. Preliminary steps have been taken by the Rand Water Board in connection with the commencement of the work, but it is probable that, in view of the war, the work will be delayed.

Income Tax Act.—This Act exempts from income tax (*a*) mining profits which are already subject to taxation under the Mining Taxation Act, 1910, (*b*) Dividends received from companies whose profits have been so taxed, and (*c*) dividends from companies paying the income tax on the profits from which such dividends are derived. Legal opinion differs as to whether it is permissible for the Government to tax interest on debentures and debenture stock of gold mining companies, the provisions of the Act not being sufficiently clear on the point. It is likely, therefore, that this and other points which will arise in carrying out the Act will have to be decided by the Courts.

Commissions.—During the past year reports have been issued by the following Commissions :—Sunday Observance Commission, Economic Commission, Dominions Royal Commission. These reports have already been published in the newspapers. In each case the views of the mining industry were placed before the Commissions by the Chamber of Mines.

THE PRESENT POSITION.

There has so far been little dislocation in the operations of the gold mining industry owing to the war. The exigencies of the situation thereby created precluded the usual procedure being followed as to disposing of gold, but this matter was promptly taken in hand by the Union Government, the Bank of England, and the South African Banks, resulting in satisfactory arrangements being made whereby all gold produced could be speedily realised. The Chamber of Mines at once made exhaustive enquiries regarding future supplies of certain important commodities consumed on the mines (which hitherto have been imported principally from the Continent of Europe), more especially cyanide, zinc sheets, and mercury. It is satisfactory to be able to report that arrangements have been made whereby it is hoped the industry will be kept supplied with these three very essential commodities. As regards other supplies, a committee of the Johannesburg Chamber of Commerce and a committee of mining material merchants met the Chamber of Mines and offered their cordial co-operation in all efforts to maintain the industry at its highest pitch, and to this end undertook to keep prices on the most reasonable basis possible. Subsequently the merchants supplied particulars as to stocks in hand, whilst the Chamber of Mines supplied them with the probable requirements of the industry, and arrangements were made by which it is hoped all the requirements of the mines will come forward regularly. Thus there is good reason to think that the Rand gold mining industry will be able to continue at a normal rate so far as the output of gold is concerned, more especially as, owing to the closing down of the diamond mining industry, the native labour supply, which had previously commenced to show improvement, may be materially increased later on. Against this, however, it must be borne in mind that not only will the cost of supplies be enhanced owing to the increase in freight and, in many cases, in the prices of raw material, but also for the reason that on many mines the organisation has been, and is being, considerably upset owing to many experienced men being called out on active service.

IMPROVED POSITION AT THE ZAAIPLAATS TIN MINE.

Milling Resumed—Better Development Prospects—Labour and Water Supply Now Satisfactory.

The directors' report on Zaaiplaats Tin for the quarter ended 31st October, 1914, states, *inter alia* : The mill ran 5.8 days (15 stamps 24-hour basis), crushing 1,020 short tons, the duty per stamp being 11.7 tons per 24 hours. In addition 2,342 short tons of sands and slimes residues were re-treated, while 1,200 tons of overburden were dealt with by the alluvial plants. The output for the quarter amounted to 38 long tons of concentrates, assaying 69.0 per cent. met. tin. At the commencement of the quarter, owing to the outbreak of hostilities and the consequent closing of the Metal Exchange, all milling operations were suspended, and the manager was instructed to take in hand the renewing of the battery foundations and repairing of other sections of the plant. This work was completed about the middle of October, since which date milling operations have been resumed. The nett expenditure incurred during the three months under review was as follows : August £2,576 11s. 1d., September £1,994 17s. 9d., October £2,525 17s. 5d. — £7,097 6s. 3d. ; to which must be added the usual adjustments in respect of shipments made to 30th June, 1914, £42 3s. 0d. ; total, £7,139 9s. 3d. (N.B. The 38 tons of concentrates produced have not been sold, and have, therefore, not yet been taken into account as revenue earned during the quarter.) *Mining.*—Operations underground were partly restricted in accordance with the measures taken to meet the position created by the closing of the Metal Exchange. Work was confined to the most important areas in Nos. 6 and 13 Sections. No. 6 Section : Two valuable branch bodies were located in the 6E in the course of exploration. The main face is unaltered. No. 13 Section : Considerable progress was made in the main face, where the condition and prospects of the ore body are good. "A" Branch, which was referred to in the last report, has grown steadily in size, and is now one of the main producers in this section. During the quarter 4,138 tons of ore were mined and disposed of as follows : Waste sorted, 162 tons ; sent to mill, 1,020 tons ; added to reserve dump, 2,656 tons ; total, 4,138 tons. In addition some 1,000 tons were broken in the mine, but had not been hauled to the surface. *Surface Prospecting.*—Work on the alluvial plants was practically suspended during the quarter, only 1,200 tons of overburden having been dealt with. *Native Labour.*—The services of a number of natives were dispensed with in August when milling operations were suspended, and during the ploughing season it is always found difficult to again get together the full complement of boys. Since the close of the quarter, however, boys have come in more freely, and it is anticipated that there will shortly be sufficient for the company's requirements. *Water Supply.*—No rain fell during the quarter, and the drought has been very severe. The manager, however, reports that good rains have recently fallen, and an ample supply of water is now available.

MINING ENGINEERING AS A PROFESSION.

Ethics, Powers and Responsibilities of the Calling—Influences of the Stock Exchange—A Link Between Labour and Capital.

By Hennen Jennings.

Some months ago we printed an extract from the lecture delivered by Mr. Hennen Jennings before the Columbia School of Mines. The following is a further extract from the same thought-compelling paper, which we are enabled to print through the courtesy of Mr. Samuel Evans:—

The capriciousness of ore deposits is an acknowledged fact and problem in mining, and the wise balancing and weighing of probabilities and possibilities, so as to make good guesses, based on slender foundations, is the great and final accomplishment of the successful mining engineer. Mining is not an unreasonably hazardous business if its capriciousness is recognised and if initial payments for unproved chances are not made too great, and expenditures for equipment are not undertaken upon insufficient foundations, and risks are averaged by spreading them. Advantage has been taken by promoters and manipulators of the legitimate uncertainties of mining, to excuse the wildest mining ventures and the exploitation of stock certificates, rather than ore deposits. This has handicapped legitimate mining by making it difficult to obtain promising initial prospects at sane prices for purposes of honest test. It also tends to belittle the good name of a basic industry upon which modern civilisation rests. The fallacy of the belief that mining can only thrive through the Stock Exchange is known to those who have been connected with big mining affairs, and have seen that successful enterprises have been initiated and carried through dark days of slow development and depression, by people who have knowledge, courage, and money to back their convictions. The Stock Exchange shows its greatest activity when least needed, that is, in inflating success and exaggerating failure. The transactions of the mining and other engineering societies, as well as the honest and high-class publications of the leading technical press, are giving such educational light that it is hoped and believed that mining exploitation by the Stock Exchange is very much on the wane. To be fair to the Stock Exchange, it has often caused successful mines to be developed, which otherwise would not be worked at this time, but the profession with which I am dealing has not the Stock Exchange as its guiding star. It must nevertheless be acknowledged and understood that mining is not undertaken for making statistical showings, or for philanthropic purposes. Its fundamental idea is to make money for those who undertake it, and the success of the mining administrator or engineer is largely gauged by the return of profits he can show.

After the protection of the lives of his workmen, rightly the engineer's first duty is loyalty to the owners of the enterprise that employs him. The owners, who put up only their own money, have a right to decide to what extent they make their business and engineering information public. But, when a limited liability corporation is formed, the case is entirely different, for this means the partnership becomes unlimited, and, as all partners have right to knowledge, the engineer's loyalty to his owners changes from the few to the many. In writing reports for private owners, the engineer should protect himself and the public by placing before himself, and then on record, all facts obtainable in any way bearing on the problem, and then, and only then, write his conclusions, submitting the report to his principals upon condition that, if made public, it will be given in its entirety, or as edited by himself. The essence of engineering ethics is to obtain full truth, first for himself, then to give it in full to his employer. If this is done with industry and frankness, all the other ethical rules with which our engineering associations are struggling, will be but corollaries. The secrets of mining should be more and more confined to those given by nature. Mining titles and laws should be established with more certainty, so the most generous and honest are not handicapped or preyed upon by the most shady and dishonest. The subject of the relationship and preparation of students for the mining industry has been a fruitful theme of papers in transactions, and addresses to colleges and universities, and it is not necessary for me to emphasise its importance. The interlocking and parallelism of the educational needs of different branches of the engineering profession were clearly recognised and set forth by Professor Monroe ten years ago, who, at the same time, pointed out the necessity of a greater diversity of knowledge for the mining student than for any other branch of engineering. The decision of this University to demand from all applicants for engineering degrees a sound foundation of general culture before specialising, and equal to that preliminarily required in any other profession, is only in keeping with what I have endeavoured to show to be the great responsibilities and powers, which have of late years been demanded of mining and other engineers.

It is obvious that in the early days of big mining the accomplishment and numbers of technically trained men did not equal or fit the demand, and that many forceful, talented, energetic men must have risen from the ranks to leadership. They were the first in the saddle, and, naturally, did not always see the full necessities of training, without which they themselves had succeeded. But assuming equal individual ability, the wastefulness of acquiring knowledge by only personal experience, and not by making use of the stored experience of others, must tell against the merely practically trained man. The great self-made mining men of the past must be recognised and reverenced, both in the technical societies and schools, for they have been the pioneers and makers of history. Though in time a degree from an engineering school may, and should be, regarded as a first necessity, the demand for it should not be made retroactive. The student of the future should only regard his degree as the trainer's certificate of efficiency and soundness, for a race and struggle, still ahead of him. Practice, as well as theory, is essential. The danger of only theory in formative years, even for the diligent student, is that the slowness of results and drudgery of practice become distasteful, and commercial success not so palatable or satisfying as to those who work their way up from the ranks. Your school of summer practical training, giving students a preliminary contact with actual work, is excellent so far as it goes, and its success has been shown by how greatly it has been copied. It is to be hoped that even greater demand will be made by the schools for early practical experience, and to be rewarded by a post-graduate degree. Students who have worked for wages and have obtained approbation of employers, and have been thrown into intimate contact at the formative time of life with the ordinary wage earner, on equal terms, have obtained an experience most desirable and most necessary for the engineer.

In these days of impersonal corporation ownership, the closest and most intelligent link between capital and labour is that of the engineer. To be of the greatest use he should know the life, ambitions, and viewpoints of each, and bring wisdom and sympathy to both sides, in the bitter and dangerous struggle that is now going on between those so intimately bound and tied together, that the paralysis or death of one means the same for the other. Such experience can only be advantageously obtained for the engineer before he has assumed responsibility of leadership in dealing with labour. It is the right labour viewpoint and basic principles of business economy that should be more and more given to mining and other engineering students. Engineering training should not simply be limited to those certain to practice it—it should be used and looked upon as a gateway to leadership in all great business enterprises, for it is fundamental in its training, and teaches the necessity for accuracy, the search of truth, probing error, and the frank acknowledgment of limitations. The gigantic forces set so recently in circulation by the miner and engineer must not only be better understood by the professional man, but also by all leaders of affairs. What is the use of a perfect engineering report if but hazily and imperfectly understood by those who have to use it? As to general culture, do the old dumb-bell mental drills of the past, which might be well adapted for a different set of knowledge and economic conditions, hold good when the new economic conditions have revolutionised sciences, wealth, and opportunities of education?

Brakpan Mines.

The secretaries write:—We are directed to give you the following information in respect to the November, 1914, output: Stamps working, 140; running time, 28 days; ore crushed, 53,050 tons; tube mills working, 9; ore hoisted, 59,867 tons; ore from dump, nil; waste sorted, 13·69 per cent.: fine gold declared, 17,529·18 ozs.; value declared, £73,789, equal to 27s. 9d. per ton milled; working costs, £49,401, equal to 18s. 7d. per ton milled; working profit, £24,388, equal to 9s. 2d. per ton milled.

Situations Vacant.

WANTED, Mechanical Draughtsman, for three to six months' temporary work. Apply, stating age, experience, with copies of references and salary required, to
General Manager, P.O. Box 82, Vereeniging.

Correspondence and Discussion.

Comments on Questions Arising in Technical Practice or Suggested by Articles in the Journal—Views, Suggestions and Experiences of Readers.

"What's Wrong with Rand Scientific and Technical Societies?"

To the Editor, *South African Mining Journal*.

Sir,—Further to "Northumbrian's" letter re the above, I may state that my membership is limited to the Geological Society. During the last few years papers in the Transactions have been characterised by an extravagant use of the more abstruse terms of mineralogy and petrography, which very frequently have a distinct flavour of Freiburg. Very frequently such papers have little claim to merit, and really their outstanding characteristics consists in the use of an obscure terminology. In some cases I fear it is the expression of what might be termed "pedagogic snobbery." Many of the members have not had either the advantages or disadvantages of a course of training at Freiburg, or even the School of Mines, and prefer to read their geological literature in simpler terms. This they can do in the reports of the Government Geologist, in the works of Hatch and Corstorphine, or of Molengraaf. Might I ask some of our geological writers to turn back to the pages of one of the fathers of geology, Hugh Miller, and study geology as a form of literature. Let them also read Robert Louis Stevenson and note that the finest writers of English use the simplest terms. Let them also, when they write or speak, always remember the majority of their audience, remember the amateur in geology as well as the professional.—Yours, etc.,

MEMBER OF GEOLOGICAL SOCIETY.

The Motor Car in War.

To the Editor, *South African Mining Journal*.

Sir,—The appended paragraph, which, funnily enough, I cut out of your own paper a year ago, speaks for itself with ironic interest at this juncture. Doubtless you will say *De mortuis*, but I prefer *Littera scripta manet*.—Yours, etc.,

"AUTO."

General Beyers, in the course of an interesting speech to the members of the Transvaal Automobile Club on Saturday, at the presentation of the Schlesinger Trophy, foreshadowed the creation of an Automobile Reserve in connection with the South African Defence Force. For heavy transport motor traction has long been in use in all modern armies, but it is something different that General Beyers has in view, namely, the tactical use of the ordinary light motor car which is so familiar on our streets and country roads. During the late Balkan war every exploit of the new science of aeronautics was duly chronicled by the correspondents, but they had little to say about the employment of the motor car except incidentally in connection with their personal adventures. General Beyers, however, states that the motor car was used extensively, and he predicts that the time is not far distant when its use will be general in times of war and civil disorder. Difficulties in the way of rough roads are certainly not likely to prove a more serious obstacle in South Africa than among the Balkan mountains and valleys, if the descriptions given by travellers in these parts are to be relied upon. He proceeded to give a few examples of the services that could be rendered by motorists in their own cars. It must be admitted that the definite organisation of the Automobile Reserve as a part of the Citizen Force is necessary, and it must participate in peace manoeuvres. Motorists welcome the proposal, not merely as giving them a special place in the nation's organisation for defence, but also since the development of the use of the motor car for military purposes will give them fresh ground for urging on the Government the necessity for good roads throughout the country. South Africa, with its immense area, cannot expect to get all at once "roads like those of England and the Continent"—though General Beyers thinks that the time is not far distant when it will—but there is obviously vast room for improvement.—Extract from "S.A.M.J., Sept. 20, 1913.

Irrigation and Water Conservation.

To the Editor, *South African Mining Journal*.

Sir,—In connection with your remarks on wealth running to waste, the following extract, which will doubtless be of interest and value to many of your readers, is taken from a paper by Mr. A. M. A. Struben, read before the third annual congress of the South African Irrigation Association, held at Graaff-Reinet last year: "The writer is strongly of opinion that South Africa must develop its own engineering practice in irrigation, and not too slavishly follow the practice of other countries, as differences of conditions, of physical features, seasons, materials and labour, will frequently render what is good under the conditions of those countries utterly bad here. In the development of irrigation works in this country the farmers have shown remarkable aptitude in making the most of local circumstances and frequently exhibit what may be termed an inborn engineering instinct. They have, often unaided by scientific knowledge, carried out works in a sound businesslike manner and at low cost. These works, though sometimes of not inconsiderable size, are small when compared with standards in other parts of the world, and are only the fore-runners of more ambitious schemes that must inevitably arise to cope with the rapid development which is looked forward to in South Africa. To develop sound irrigation engineering practice here, it will, therefore, be wise to study the works and methods of other lands, and to glean "tips" that may with advantage be used by us. For this purpose it will probably be found most profitable to study the practice of young countries, as these have had the advantage of the experience of older countries to guide them, and to study only such works and methods as are well suited to our local conditions. In this connection America offers some valuable object-lessons. The evolution of irrigation there appears to have proceeded on much the same lines as in this country.—Yours, etc.,

"ENGINEER."

MINING MEN AND MATTERS.

Sir Thomas Cullinan and Mr. P. Ross Frames are now at the front with the Union Forces.

* * * *

The next meeting of the South African Institute of Engineers will be held this (Saturday) evening.

* * * *

Mr. Nathaniel Wilson, formerly Consulting Mechanical Engineer to the East Rand Proprietary Mines, has received a temporary Captaincy in the Royal Engineers, and is now with his regiment at Longmoor Camp. During the South African war, it will be remembered, he saw service with the Railway Pioneer Regiment, and took part in the Zand River engagement, in which his mining colleagues, Louis Seymour and Clements, were killed. He was awarded a D.S.O. for his work on bridge building.

* * * *

The President of the Transvaal Chamber of Mines (Mr. A. E. Wallers), the President of the South African Committee of the British Medical Association (Sir Kendal Franks, C.B.), and the President of the Associated Chambers of Commerce (Mr. H. A. Oliver, M.L.A., of Kimberley), have accepted the invitation of the Executive Council to become Hon. Vice-Presidents of the South African Red Cross Society.

THE NOVEMBER OUTPUT IN DETAIL.

715,836 ozs., Value £3,040,677—Increased Labour Supply—Detailed Group Returns.

The gold output for November shows a total of 715,836 ozs., valued at £3,040,677, of which the Rand contributed 685,450 ozs., valued at £2,911,605. The output for October with 31 days was 733,746 ozs., valued at £3,116,754. The native supply was then 170,438, compared with 166,039 for last month. The figures for November were:—

Total output	715,836 ozs
Value	£3,040,677
Decrease	17,910 ozs.
Value	£76,077
Witwatersrand	685,450 ozs.
Value	£2,911,606
Decrease	18,535 ozs.
Value	£78,732
Outside Districts	30,386 ozs.
Value	£129,072
Increase	625 ozs.
Value	£2,655
Total stamps	9,848
Decrease	6

Rand Mines Group.

The following are the results of crushing operations of subsidiary companies for the month of November:—

Company	No. of Stamps Running.	Tube Mills.	Tons crushed.	Estimated Working Costs per Ton.	Total Fine Ozs.	Total Estimated Profit.
Rose Deep ...	300	7	58,400	16 1·3	17,322	£25,881
Geldenhuis Dp...	300	7	47,000	21 11·7	14,761	10,497
Nourse Mines ..	260	7	45,100	21 10·7	15,138	14,357
Ferreira Deep...	280	7	55,550	17 11·0	23,195	47,727
Crown Mines ..	660	26	184,000	16/ 4·7	57,424	90,864
Durban Rd. Dp.	100	3	21,140	21 9·3	7,264	4,297
Totals & averages	1900	57	411,190	18 1·2	135,104	£193,623

The following are the results of crushing operations of Central Mining companies for the month of November:—

Company.	No. of Stamps Running.	Tube Mills.	Tons crushed.	Estimated Working Costs per Ton.	Total Fine Ozs.	Total Estimated Profit.
Modder B. ...	96	5	42,000	14/ 4·4	17,341	£42,838
New Modder ..	180	7	50,000	15 8·1	23,251	58,684
City Deep ...	150	9	44,000	21 7·1	20,729	39,750
Village Deep ...	180	7	49,300	17 7·0	16,914	27,853
Village M.R. ...	160	4	22,900	22 0·6	11,029	21,177
Robinson	250	6	55,000	13 7·1	19,718	45,555
Bantjes Cons. ..	100	3	22,050	23 8·2	5,811	*1,703
Totals & averages	1116	41	285,250	17 5·5	114,793	£231,151

* Loss.

Bantjes Consolidated Mines, Ltd.—Loss due to temporary decrease in value of yield.

Goerz Group.

Results of operations of the crushing mines comprising the Goerz group for the month of November, 1914:—

Company	Stamps.	Tube Mills.	Tons Crushed.	Total Value of Output.	Total Profit.
May Consolidated ..	100	—	11,720	£9,059	£511
Princess Estate	60	5	21,800	28,033	1,189
Geduld Proprietary	60	5	22,100	35,445	10,609
	220	10	55,620	£72,537	£12,309

Barnato Group.

The results of operations of the Barnato group for November are as follows:—

Mine.	Stamps.	Tons Crushed.	Revenue from Gold.
Consolidated Langlaagte ..	100	50,200	£66,124
Ginsberg	75	15,497	16,966
Glencairn	160	21,040	14,669
Government Areas	90	10,700	35,389
New Primrose	155	21,200	22,308
New Rietfontein	60	7,083	6,675
New Unified	60	13,140	13,408
Quest	35	2,786	3,315
Van Ryn Deep	80	40,400	69,661
Witwatersrand	210	42,100	51,933
November totals ...	1,025	254,146	£300,448
October totals ...	935	225,578	£270,402

Mine.	Total Working Costs.	Working Costs per Ton Milled.	Gross Profit including Sundry Revenue.
Consolidated Langlaagte ..	£34,776	13·855	£31,679
Ginsberg	13,217	17·058	3,876
Glencairn	12,171	11·569	2,651
Government Areas	42,111	20·693	*6,415
New Primrose	14,049	13·253	8,570
New Rietfontein	6,740	19·032	140
New Unified	8,312	12·652	5,198
Quest	2,500	17·948	865
Van Ryn Deep	31,767	15·726	38,495
Witwatersrand	27,805	13·209	26,151
November totals ...	£193,448	15·223	£111,210
October totals ...	£157,578	13·971	£116,379

* Loss.

Monthly gross profits: January, £87,277; February, £94,055; March, £104,704; April, £104,493; May, £110,139; June, £115,230; July, £118,604; August, £117,064; September, £114,995; October, £116,379; November, £111,210.

Consolidated Gold Fields Group.

The following are particulars in regard to the outputs and profits for the month of November of the undermentioned companies of the Consolidated Gold Fields group:—

Company.	No. of Stamps.	Tube Mills.	Tons Crushed.	Gold declared, Fine Ozs.	Total Profit.
Simmer and Jack ..	320	7	70,100	18,182	£36,065
Robinson Deep ...	120	8	50,000	17,393	28,501
Knights Deep ...	400	11	95,110	18,250	19,001
Simmer Deep ...	180	9	56,400	11,368	4,105
Sub Nigel	25	1	4,400	2,306	1,826
Totals	1045	36	276,010	67,499	£89,498

The sundry revenue included in the above total declared profit is as under: Simmer and Jack, £1,800; Robinson Deep, £596; Knights Deep, £227; Simmer Deep, £601; Sub Nigel, £201; total, £3,425.

Reserve gold: Simmer and Jack, 5,600 ozs.; Robinson Deep, 2,679 ozs.; Simmer Deep, 1,810 ozs.; Sub Nigel, 430 ozs.; total, 10,519 ozs.

Simmer and Jack.—The Simmer and Jack Proprietary Mines output is high, owing mainly to thorough clean up during periodical overhaul of mill engine and to abnormal recovery of by-products.

Albu Group.

The following are the details of results regarding the November operations of the producing mines of the General Mining and Finance Corporation group:—

Company.	Stamps.	Tons Crushed.	Total Cost.
Aurora West	80	13,810	£12,366
Meyer and Charlton	75	14,530	12,934
New Goch	120	30,050	20,881
Roodepoort United	75	33,373	27,718
Van Ryn	140	37,100	26,099
West Rand Consolidated ...	100	28,000	25,544
	590	157,163	£125,542

Company.	Cost per Ton.	Total Revenue.	Profit.
Aurora West	17/10·9	£16,623	£4,257
Meyer and Charlton	17/9·6	33,232	20,298
New Goch	13/10·8	31,044	10,163
Roodepoort United	16/7·3	29,854	2,136
Van Ryn	13/11·5	47,922	21,823
West Rand Consolidated ...	18/2·9	32,402	6,858
		£191,077	£65,535

Neumann Group.

The following are particulars of the results achieved by the crushing companies of this group during last month, viz.:—

	TONS.	YIELD.	PROFIT
Witwatersrand Deep ..	12,071	£59,492	£22,039
Wolhuter	32,400	38,426	11,646
Consolidated Main Reef .	21,710	33,752	10,221
Main Reef West	21,660	21,681	1,186
Knight Central	25,180	27,284	3,836
Total for Group ...		£183,635	£51,928

Transvaal G.M. Estates.

The following are the particulars of this company's output for the month of November, 1914:—Central Mines: Tons crushed, 12,500, yielding 7,367·916 fine ozs. Elandsdrift Mine: Tons crushed, 695, yielding 826·260 fine ozs. Vaalhoek Mine: Tons crushed, 1,520, yielding 586·916 fine ozs. Estimated value of month's output, £36,559; estimated profit for the month, £21,279.

"T.G.M.E." DEVELOPMENT AND PROSPECTING.

In the quarterly report for the three months ended September 30, of the Transvaal Gold Mining Estates, it is stated, *inter alia*:—Considerable progress has been made with the work of re-opening the Beta mine. Prospecting work on the Beta Extension in the neighbourhood of the old workings of the late Grootfontein Exploration Co., Ltd., and on Hendriksdal and Klipkraal is being continued. Work has temporarily ceased on Hermansberg. There is nothing of moment to report in connection with these operations so far. Prospecting for alluvial in the Pilgrim's Creek and Blyde River continues to give encouraging results. Central Mines: Duke's Hill South Mine: The distance from the main adit to the dip in the Peach Tree mine is now only about 50 feet, and working conditions will greatly improve as soon as the connection is made. The payable zone continues towards the dip. Peach Tree Mine: The reef to the dip continues to be unpayable. The Iota section on the east side of the hill is opening up a large body of reef, but the values are only moderate. Theta: The work to locate the top reef continues; good reef has been intersected at two points. Elsewhere, where encountered, the reef has proved to be small and the values poor. Graskop: One of the main adits is now developing reef of good width and value. Brown's Hill: The reef in the lower workings continues to open up very satisfactorily, but the upper reef is only disclosing payable ground in patches. Elandsdrift: Development on the dip section continues to show good thickness and values in the reef. Vaalhoek: The development of the river section has been retarded owing to difficulties with water, the present pumping plant not being sufficiently powerful. Arrangements are now being made to increase the pumping plant. The reef lately disclosed in the main drive in this section, although maintaining its thickness, has diminished in value. Extension of plant: Orders are being placed for an additional 5 stamps at Elandsdrift with necessary additions to sands and slimes plant, and for a tube mill at Vaalhoek with necessary additions to slimes plant. Electric haulage for the river section at Vaalhoek is also being provided. The total cost of these additions will be approximately £12,600. Under existing conditions this work will probably take a considerable time to complete. Debentures: The debentures of this company having been obtainable at a price below their par value, the directors, in accordance with the provisions of the Trust Deed, have made purchases to cover the third reduction instalment of £15,000, due on 1st April, 1915, and no drawing in respect of such redemption will therefore take place.

The Pegging of Morgenzon.

Probably the oldest mine to be worked on any scale in the Sabie district was the Clewer Mine, of the Clewer Estates Co., on the farm Morgenzon. The original concession to mine for gold on this rich property was granted on the 5th May, 1883, to Diedrich Muller, Willem Schalk Burger, John Abel Erasmus, and Klaas Prinsloo. The old Transvaal Volksraad granted them a concession for fifteen years to delve for gold and other precious minerals on the farm Morgenzon. The conditions being that, in addition to the rent, 5 per cent. of the gold won went to the State. At that time the diggers here had no knowledge of a regular reef, but the field was regarded as an alluvial proposition, pure and simple; the concessionaries worked the alluvial claims only, and with a great deal of success, too. About 1888 the original concessionaires sold their interest to the Clewer Estates, who lost no time in erecting machinery, opening up the mine, and working the rich payable reef they discovered there. The working was cheap, the power used being water power, and the company earned good profits. Between the years 1891 and 1894 some £38,000 was spent in developing the mine and on machinery, and in 1894 the Volksraad reduced the amount to be paid to the State to $2\frac{1}{2}$ per cent. In 1898 the Clewer Estates obtained a renewal of the lease for a further fifteen years; and, for the last eight or nine years, till the lease fell in, the T.G.M.E., who had incorporated the Clewer Estates, obtained their greatest tonnage from this source. Since the lease expired, in May, 1913, the public of Pilgrims anticipated the proclamation of the mine again, and looked forward with interest to the opportunity to peg the ground. It was thus hardly surprising that the re-pegging of the ground on the historic mine created excitement, says the *Pilgrims and Sabie News*. The majority of those who have lived and worked here cannot believe that the whole of the fifteen hundred claims have been worked out; and those who did know anything about the mine were quite willing to take their chance of finding good payable reef. The short notice—the proclamation declaring pegging open only appeared the previous Friday in the *Pilgrims and Sabie News*—and the fact that times are very bad, accounted for the fact that there was not a big rush. Still between thirty and forty peggers were on the scene early last Friday morning, armed with numerous pegs. Some took their positions on the Peaches Krantz boundaries of the property; others manned the boundary on Pilgrims Hill. When the gun went off there was a race on horseback between two peggers for rival interests. That was the only excitement. Otherwise the pegging was conducted in a most methodical, orderly manner. Out of 1,500 claims only 246 were pegged; everyone obtained practically what he wanted; there were no disputes, and there was no unpleasantness. The pegging generally was away from the workings, those acquiring ground endeavouring to take that which was least likely to have been worked.

Rhodesian Section.

LATEST MINING NEWS.

Cam and Motor—Selukwe Columbia—Improved Position of Gaika Gold—Mayo (Rhodesia) Development—

Mr. Smith, late Smith and Morrissey, is busy on the Midwinter property on the erection of a five-stamp mill, which has been imported from the Gwelo district. This now makes eight stamps which Messrs. Midgeley, Winter and Owen have crushing on this mine, says the *Gatooma Mail*.

* * * *

The Brompton property, belonging to Mr. R. R. Aitken, has been so seriously affected by the drought that for a short time operations had to be suspended. The rain which now appears to have set in has, we are glad to know, put an end to this period of inactivity and the mine is again on full time.

* * * *

Messrs. D. and J. Laing, who were connected with the Somerset mine, in the Battlefields district, have recently purchased the Soldier mine and other blocks of claims in the vicinity from Mr. Paul Scott. A five-stamp mill has been purchased and will be erected forthwith.

* * * *

At the Victoria mine Messrs. Curtis and Coleman have been seriously inconvenienced by the prolonged dry season, but the advent of the rains has altered all this and work is now proceeding merrily on full time. The cyanide plant is practically complete and five stamps are now crushing. The owners of this promising property have a good dump of useful sand on hand, showing about 6 dwts.

* * * *

Up to the present the Washington mine has been very short of water, but things look brighter after the rains.

* * * *

The three prominent points in the return of the Cam and Motor for October, just announced, are the increased efficiency of the plant, the record extraction, and the lower value of the ore treated:—

	Tons Treated.	Gold Recovered.	Per Ton.	Extraction. Per cent	Assay Value of Ore.
To Feb. 28 ...	10,693	£16,643	—	—	—
To April 30 ...	17,711	24,574	27/9	57·6	48/2
May	11,120	13,958	25/1	57·8	43/5
June	10,409	15,201	29/2	63·1	46/1
July	12,234	15,867	26/-	63·6	41/5
August	11,997	16,210	27/-	64·1	42/2
September ...	11,870	16,709	28/2	65·3	43/1
October ...	12,435	17,109	27/8	69·3	39/9

The tonnage is the greatest treated in any one month, and there is a notable improvement in the extraction—no less than 4 per cent. above that of September. The gradual increase, as shown in the table, proves that the efforts of the management are meeting with success, though the pace, generally speaking, is slow, seeing that 85 per cent. is expected. The only disappointing factor is the assay value of the ore, which is the lowest yet dealt with. But possibly there may be some explanation, as the average value of the reserve is 44s. 6d. per ton.

* * * *

The Selukwe Columbia report for the year ended June 30, 1914, states that several of the claims of the Yankee Doodle mine have been allowed to go to forfeiture as of no value. Twenty new claims have been acquired adjoining the Danga area in order to form a more compact block and to provide a mill site. A small dam is situated on one of these blocks. The total number of claims held at the present time amounts to 192. The company holds in addition certain tailings and pumping sites, etc., and a farm of 6,000 acres. Towards the close of 1913 the Yankee Doodle mine was let on tribute, and up to the end of the financial year the company had received £745 in royalties. Work has been pushed on with energy on the Wonderland, Chimborazo and Danga claims. At the end of the financial year the ore reserves were estimated at 20,000 tons of an average of 11 dwts., valued at approximately 44s. per ton. The results of recent developments have, on the whole, been satisfactory, particularly on the Danga section. The directors have sanctioned the erection of a 10-stamp mill and sands plant (utilising a portion of the old plant) at an estimated cost of £6,000. It is proposed to add, if necessary, a slimes plant at an additional cost of £1,200. The mill is expected to commence work about the end of the year. The profit and loss account shows receipts from gold won, interest, etc., £30,891, and a credit balance carried to balance sheet, after providing £3,210 for depreciation of plant, of £9,579.

* * * *

The twelfth ordinary general meeting of the Gaika Gold Mining Co., Ltd., was held in London recently. The Chairman, in moving the adoption of the report, said: The results of the year are of a satisfactory nature, and the position of the company is now a very strong one, while its prospects for the future are most encouraging. Referring to the accounts, you will see by the profit and loss account that the gold won amounted to £87,036, as against £59,837 last year, and the net profit to £29,126, as against £5,838, although we have this time, in addition, set aside £4,356 out of profits as a gold reserve. The expenditure at the mine is £48,087, as against £48,012 last year, and the London expenses are reduced by £233. Turning to the balance sheet, I think the figures given are so full and self-explanatory as to call for little remark from me. On the debit side you will note the cash reserves now total £28,250, while the cash position, after paying during the year dividends amounting to 10 per cent., shows a very substantial sum, from which we hope to pay further dividends.

In pursuance of the policy hitherto adopted, a liberal amount has been expended during the year on exploration and development, with the result of increasing the ore reserves from 71,893 tons, averaging 14.44 dwts., to 100,770 tons, averaging 14.62 dwts., being about three years' supply to the mill. Almost the whole of the cost of development and exploration for the year has been charged to working expenses, so that, with the increase in ore reserves, our development account works out at a much lower figure per ton of ore reserves than in the previous balance sheet. In addressing you at last general meeting I referred to the difficulties we had in connection with the ore treatment, and I am now glad to say that our engineers, by certain improvements and additions, have succeeded in almost entirely overcoming these difficulties. They have done so at small cost, and without the great expenditure which a change in the mode of treatment would have entailed upon us. I take this opportunity, on behalf of the board, of warmly acknowledging the patience, perseverance, and skill which they devoted to this subject for more than a year, and I am sure the shareholders will heartily endorse this acknowledgment. During the year we have had a plentiful supply of native labour, but, on account of the great drought which has prevailed, we have had considerable difficulties in getting a sufficient supply of water to the mill, and are still threatened with a shortage. We have, however, made arrangements very recently which

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we hope will tide us over the dry season. The new auxiliary shaft on the north section of the mine going down from the 10th level, and referred to in the consulting engineer's report, has now been carried down to the horizon of the 11th level, and cross-cutting started to the reef, which the shaft passed through at from 50 ft. to 60 ft. below the 10th level. At 50 ft. to 55 ft. the reef assayed 11.4 pennyweights over 75 in., and at 55 ft. to 60 ft. it assayed 6.3 dwts. over the same width.

Before sitting down you will naturally wish me to give some indication of the progress at the mine since the date of the balance sheet, and I am glad to say that for the three months ended September 30 the returns exceed a little the average of last year. The unhappy war has so far only given us slight inconvenience and expense, and I hope Rhodesia may escape serious effects arising out of it. The stock of stores at the mine is fairly substantial, and, in combination with other Rhodesian mining companies, every means has been taken to secure regular supplies as far as possible ahead.

* * * *

The ordinary general meeting of the Mayo (Rhodesia) Development Company (1908) was held in London recently, Mr. Charles Frederick Rowsell (the chairman) presiding. The Chairman, in moving the adoption of the report and accounts, said: The revenue for the year amounts to £4,000 odd, as against £7,000 odd last year. On the expenditure side of the profit and loss account the total amounts to £4,986, as against £16,208 last year, which, however, included a large amount written off against cost of Commonwealth Gold Mining Co., Ltd., shares. The year has not been one for the realisation of profits on the Stock Exchange, and therefore revenues have mainly arisen from interest and dividends, and we have every reason to believe that this will be a constantly accruing figure. Turning to the balance sheet, our cash, investments, and loans against securities amounted to £33,379, as against £30,313 last year. The increase in the item headed shares and debentures in other companies from £99,999 to £125,431 accounts for the diminution in the cash and the increase of loans on the other side of the balance sheet. Taking the first four items of the balance sheet, you have a total of £158,814. Of this over £91,000 is represented by cash, investments, shares, and debentures in other companies having a market quotation. The war, of course, has affected industries, in many cases very severely, but in the case of the British Cyanide Co. it has greatly improved its position. On the outbreak of war it was necessary for the mines to rely upon British manufacturers for their supplies. I look to this investment to produce very substantial results during the next twelve months.

The Cam and Motor Company is now crushing, and its output is gradually improving, and at no far distant date I think we may expect to see it enter the dividend-paying stage. The Golden Kopje Proprietary Mines Co. should even now be earning profits, but, unfortunately, there have been two breakdowns in the machinery. In spite of this, their engineer on the property gives every reason to hope that the mine will be in full swing and earning the anticipated profits of 15 per cent. about the end of the year. As to the Lonely Reef Gold Mining Co., this, as you are aware, has already reached the dividend-paying stage, and earned last year 30 per cent. The Shamva Mines, in which we have 9,500 shares, is rapidly approaching the dividend-paying stage and I hope that the first dividend will be declared certainly not later than the first month in next year. The chairman of this company estimated that the profits would be at the rate of 40 per cent. per annum. As to the Tip Top Gold Mining Co., Mr. Parsons takes a very hopeful view of its prospects. The Union Steel Corporation of South Africa, apparently, did not make a very good start, and further funds have had to be found to increase the plant and generally to improve the position. Here, again, the outbreak of the war is likely to have an important effect, as two of the principal competitors we had to fear were Germany and Belgium. As I have always told you, I have a very great belief in the future of the United Rhodesia Gold Fields Co., and I do not think that this investment need give us any uneasiness. In conclusion, I hope that we may consider our company is in a strong position to weather any future storms which may come along, and that we shall be earning during the coming year quite a substantial income from our investments.

How to Make Money Tnough Mining.

In the course of an address before the Northern California and Southern Oregon Mining Congress a few weeks ago, William A. Burr gave some excellent advice that we cannot do better than reproduce. He said: Keep the mill running, keep the stamps dropping: don't hang up for every little thing. Teach your men to change screens in three minutes: to dress plates, if you insist on amalgamation, in ten minutes. Teach them to adjust a tappet on one stamp with the other four dropping. Teach them to feed so that the stamps will rebound without pounding cold iron. Teach them to keep grease on the cam shaft and bearings and not in the mortars and on the plates. Teach them to make repairs without shutting down the mill. Teach them to make the concentrators do their work, and not to try to secure results from them with an inch of pulp running over them. Teach them to keep track of the time lost by various machines and of the reason for such lost time. This gives them a due appreciation of how much the capacity of the mill is being curtailed by the "hanging up" habit, affords a basis for the accurate approximation of the tonnage passing through the mill, gives a line on the competency of the mill man in manipulating the plant, and serves as an indicator for the management and the metallurgists as to defects in the machinery or in its installation. Above all else, teach them to keep the mill clean. The mill man who turns his shift over with shafting and machinery lubricated and floors swept and dry, is entitled to protest if the man on the opposite shift does not turn the mill over to him in the same way. If you are cyaniding, teach him not to try to filter through a one-eighth inch carbonate of lime. Teach him to run the tank samples, and solutions by the clock, to plug leaks in tanks and launders and avoid losses in solution, as that means losses in money. In conclusion, I will say, don't decry the scientific part of milling and other branches of metallurgy, but absorb as much of it as you can, subscribe for the leading mining journals, they will get you abreast and keep you abreast of the times. Hydro-metallurgy is making great strides; it has brought about a new era in many gold and silver camps which were formerly hopelessly unprofitable. It is doing the same thing for copper camps to-day.

The main interest in the metallurgy of copper has centred recently on the recovery of the metal from poor ores by leaching. Most American copper producers are busily engaged in the solution of the question, and the results so far obtained point to the probability that we are on the eve of most remarkable development in this direction

Engineering Notes and News.

A German Metal Combine.

With a view to securing the supplies of metal necessary for war purposes, a noticeable step has been taken in Germany by the formation of a combine of the leading metal firms. A company was formed at the beginning of the war, with a capital of 6,000,000m., for buying and distributing the metals required for munitions of war. According to particulars of the participation which reach us from America, the following firms have shares in the company: Beer, Sondheimer & Co., Frankfort-on-Main, 500,000m.; Dr. Cassirer & Co., Charlottenburg, 100,000m.; N. Levy & Co., Berlin, 100,000m.; *Metallgesellschaft, Frankfort-on-Main*, 500,000 m.; M. M. Warburg Hamburg, 500,000m.; Aron Hirsch Sohn, Halberstadt, 200,000 m.; Allgemeine Elektritzitäts Gesellschaft, 500,000m.; Bergman Elektritzitätswerke, 400,000m.; R. Seidel & Co., Reinickendorf, 200,000m.; Felton & Guilleaume, Carlswerk, near Cologne, 200,000m.; Neiderschoneweide Steel Works, 100,000m.; Hirsch Copper and Brass Works, 200,000m.; C. Wilh. Kaiser & Co., 100,000m.; Deutschland Copper Works, 100,000m.; Ludw. Lowe & Co., 200,000m.; Siemens-Schuckert Co., 500,000m.; Fleitmann's Nickel Works, 400,000m.; Wieland & Co., Ulm., 400,000 m.; Basse & Selve, Altona, 400,000m.; Karl Berg, Eveking, 100,000m.; and Polte Works, Magdeburg, 200,000m. The company will buy all metals and metal products required for industrial purposes by the Army and Navy during the war. The War Office and the Ministry of Commerce and Industry are entitled to appoint commissioners, who will have the right to veto any decision of the board of management. The company began business on September 1.

Electrical Cooking.

The Second Assistant Electrical Engineer of Durban, Mr. Brownell, addressed a meeting of the Municipal Employees' Association recently on "The Construction of Electrical Appliances." Many specimens of appliances were shown during the course of the address. Mr. Brownell, in his opening remarks, referred to the introduction of electricity, and traced its progress through the early stages, when it was used for bells and telegraphs. Then followed its use for lighting, and the use of incandescent lamps disclosed its value for heating purposes. From this was gradually evolved cooking by electricity as it was found to-day. It was still far from a perfect system, but was being used more and more, and as its use became more general the appliances would naturally become more cheaper, and more within the range of a larger circle of the population. One of the reasons why electricity had not progressed to a greater extent was because of the opposition of other interests. He noticed, however, that the conservatism of the gas companies was gradually giving way. Durban had advanced more quickly in the use of electricity than many older towns in England, where there were only, as far as he knew, twelve places which sold current cheaper than they did at Durban.

Rand Water Board New Works.

"The 3 inch branch pipe from the Board's main at Modderfontein B. to water column, South African Railways, was completed on 30th October, the total length of pipe laid being 11,277 feet," says the Acting Chief Engineer in his report for last month. "During the month, also, a 4 inch meter connection was installed on the property of the Crown Mines, Ltd., and also a 3 inch meter connection for the South African Railways to supply about 25,000 gallons a day at the Administration's water column at Modderfontein B. A 3 inch 'Bee' meter at the York Mine was removed on the 3rd ultimo. The valve at the 1½ inch 'Bee' meter at the Craigie Mine (late Palmer's North Rand G.M.) was opened on 2nd October. The whole of the plant under Contract No. 132 has now come to hand, and one pump is being temporarily installed in No. 6 shaft, Zuurbekom. When this installation is complete, it is estimated that the water supply from Zuurbekom will be increased from 6·7 million gallons to 7·2 million gallons per day, which is the maximum capacity of the existing plant available for pumping water from Zuurbekom into service."

It has been found by experience gained from the turbines installed at the Johannesburg Municipal Power Station that the low pressure blading is the first to deteriorate, due to the moisture of the low pressure steam. Messrs. Reunert & Lenz, sole agents for the turbines installed, have been given an order for eight rows of low pressure blading, suitable for Nos. 1, 2 or 3 turbine.

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Commerce and Industries.

Possible Market for Lucerne.

In reply to an enquiry by the Transvaal Agricultural Union as to the possible demand for and price of baled lucerne on the English market, the following communication, according to the latest Press Circular of the Agricultural Department, has been received from the Acting Trades Commissioner, London:—

"There has been no lucerne imported during the last two years, and, so far as is known, none from South Africa at any time. It is, therefore, very difficult to say anything as to the present value of lucerne in this country. The best lucerne is of greater value than, or at least as great as, English Clover, and, if small lots were put on the market, they should be worth at London or Liverpool from 90s. to 100s. per ton. These prices would not be obtained, however, if, say, a whole cargo were put on the market at one time, as former experience goes to show that the demand for lucerne is limited to town cow keepers, and is so small that the arrival of even a small cargo upsets the market. It is possible, however, that as its value became known the demand would increase. There has been a talk of negotiations for the importation of lucerne from San Francisco, and it is understood that a sample lot of lucerne from San Francisco via the Panama Canal is now on passage."

* * * *

Building Slump.

The building slump in Johannesburg continues. Of course, it does not necessarily follow, even in boom times, that the presentation of plans to the Municipality means actual building construction, but just now figures show that the number of designs laid before the Works Committee has decreased to a remarkable extent. During October, it will be remembered only 195 plans of all sorts, including 35 drains, were approved, the estimated cost of construction being £15,378. For November the position has slightly improved, but even so only 216 plans, including 30 drains, were submitted and approved, the cost of construction being put down at £17,177.

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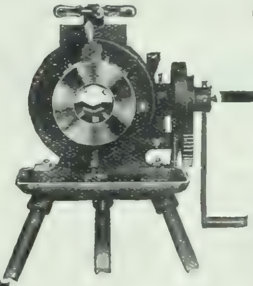
E. J. MOYNIHAN, Consulting Engineer, 35 and 36, Cuthbert's Buildings, Eloff Street, Johannesburg, P.O. Box 2061.

Progress of the Trade War.

It cannot be too widely known throughout the United Kingdom and the British Empire that the Commercial Intelligence Branch of the Board of Trade has made very complete arrangements for manufacturers in the Empire to ascertain the fullest possible technical details relating to the supplies of goods hitherto drawn from Germany by English merchants. A printed statement has been drawn up showing the position very clearly, while what are termed a series of "exchange meetings" have been arranged, under the auspices of the Government, at which manufacturers and wholesale dealers in all departments will be invited to come together and do business. The matter is of particular importance, in view of the approaching Christmas season, with its unlimited demand for Christmas cards, toys and light articles of every description suitable for presents, a large proportion of which have hitherto come from the other side of the North Sea. As this source of supply will be closed at least for the remainder of the year, and probably after that, English manufacturers have an unparalleled opportunity for showing what they can do in a class of trade which has passed more and more under German control. The Board of Trade are also engaged upon the tabulation of goods hitherto derived by merchants in the Overseas Empire, and also in other parts of the world, from Germany, and this information will also be published as soon as possible. The energy which has been displayed by the Board of Trade, through its Commercial Intelligence Branch, since the European war broke out is most praiseworthy, and trading interests are speaking in the highest terms of the assistance which they have received from the ninety or more officials who have recently been appointed to this Department. There is a strong feeling, however, that, excellent as are the arrangements which have been made in this connection, the position cannot be regarded as entirely satisfactory until a Ministry of Commerce has been formed to permanently protect and advise the commercial houses regarding the class of goods to which they should devote their attention, together with whatever relative information [illegible]. It is also felt among merchants and traders that better credit facilities are required from the banks and that the Government should bestir itself in this connection.



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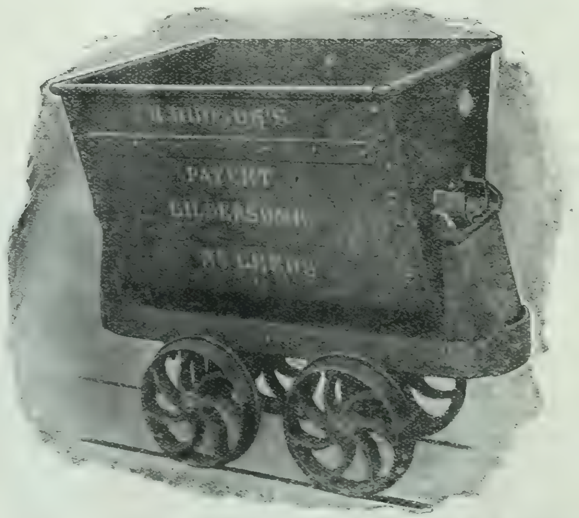

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THE SOUTH AFRICAN
Mining Journal,
WITH WHICH IS INCORPORATED
South African Mines, Commerce and Industries.
ESTABLISHED 1891.

VOL. XXIV., PART I. DECEMBER 19, 1914. [No. 1212.

HEAD OFFICE: 176-180, Stock Exchange Buildings, Fox Street (2nd Floor), Johannesburg, Union of South Africa.

Telephone **913.** P.O. Boxes **963** and **418.**
Cable and Telegraphic Address: **"MININC JOURNAL."**

AGENTS FOR GREAT BRITAIN: Argus Printing and Publishing Co., Ltd., Byron House, 82-85, Fleet Street, London, E.C.

AMERICA: Advertisements accepted from any recognised Advertisement Agency.

ANNUAL SUBSCRIPTION RATES: Oversea, £2; South Africa (by post), £1 10s.; Local Delivery (Town only), £1 6s.

Copies of this journal are obtainable at all Branches and Agencies of the Central News Agency, Ltd., at all News Agents and Railway Bookstalls throughout South Africa, and at the London Agency as above.

NOTICE.—The postage of this issue of the *S.A. Mining Journal* is: South Africa, 1d. All other parts, 1½d.

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Notes and News.

Modder Deep Mill.

After the usual preliminary run to test the smooth working of the plant, and the addition of the finishing touches that can only be effected after such trial, the mill at the Modder Deep is now in full operation. As already announced, the first output declaration will be made for the month of January.

* * * *

"Safety First" and the Accident Season.

It is a sad fact that with the approach of the holiday season the accident rate on the mines usually tends to increase. For reasons touched on in these columns last week, the coming season is hardly likely to prove any exception to the rule, unless a special effort be put forth by all concerned to counteract the accustomed carelessness of the time. In this connection it should be made clear that the remarks in our last issue regarding the inappropriateness of our preaching "Safety First" during war time must not be construed as meaning that its practice on the mines is any the less desirable. Because men are dying in millions on the battlefield, is no reason why the life and limb of our industrial workers should be any the less carefully conserved.

* * * *

Transvaal and Delagoa Bay Investment Co.'s Finances.

A printer's error crept into the note in our last issue dealing with the Transvaal and Delagoa Bay Investment Company's finances. The realized net profits for the year, after writing off £7,762 for depreciation, was £41,382, and not £4,182 as stated.

* * * *

Swiss Views on German Finance.

Some very candid criticisms of German war finance are contained in the lately-issued annual report of the Swiss Bankverein, an institution which has for many years had close relations with Teutonic financiers. It is pointed out that in Germany the situation is gradually becoming more strained, "although the stock of gold in the Reichsbank has considerably risen, partly owing to deposits by the Government, which were kept in the fortress of Spandau, partly to the issue of small notes." The increase in the bills, on the one hand, and in the notes in circulation, on the other hand, reflects the enormous claims which have been made on the Reichsbank since the war began, while on October 15 loans on various classes of securities totalling £55,500,000 had been made by other institutions. "The notable depreciation in the German exchange to almost 10 per cent.," it is added, "seems to justify the growing misgivings which are now gaining ground in respect of Germany's financial position."

* * * *

The Diamond Market.

A diamond market correspondent of the *Financial News* writes: Although business is more or less nominal, the stability in prices is remarkable. It is quite impossible to purchase in any quantities below the prices ranging before the war. It may occasionally happen that there is a seller of a small parcel who must realise for cash and is, therefore, prepared to take a lower price, but such cases are really exceptional. The trade is wonderfully well financed and the banks have given every possible assistance. The Amsterdam trade has combined not to show stocks to anyone who thinks he can buy under market price, and the Antwerp banks have notified their customers that they strongly advise them not to realise under prices ruling before the war. The American position owing to scarcity of money has reflected on the diamond business, but as it is anticipated that by the end of the war the United States will have derived great benefits and business will correspondingly revive the diamond business will get its share. The stock of cut goods is not being increased; on the contrary, it diminishes continually with every little business done. To sum up the situation, considering the stress of times, business is absolutely sound. There is no doubt that the syndicate, which is the principal factor as far as rough goods are concerned, will not attempt to sell anything till such time as the market can absorb the goods, and that the United States, our biggest customer, will again buy as soon as money circulates freely.

* * * *

After the War.

The Right Hon. Lord Inchcape, the President of the Institute of Bankers, in delivering his inaugural address last week, said that with the continent of Europe practically closed to international commerce, there must be a great shrinkage in most departments of trade so long as the war lasts. "There will be a shrinkage in the consumption also," he added, "which will adversely reflect upon most branches of trade. When the war is over the taxation which will be a burden upon Europe for many years to come, the enormous destruction of property on the continent, the waste in non-productive expenditure entailed by the war, will set back international trade for some years. It may be some years before we see a return of the wave of prosperity which we have recently enjoyed, but we shall not repine if we have to shed some of that extravagance and luxury which has shown itself perhaps too freely in the past few years, if we are able to retain that place in the world which makes for culture, civilisation, peace and goodwill."

* * * *

Prisoners of War for Gold Mines.

We learn from *The Evening News*, of New Glasgow, Nova Scotia, that Mr. C. V. Holman, a well-known mine manager of that place, has written to Lord Kitchener, asking him for prisoners of war to work in the Nova Scotia gold mines. So far as the mines operated under his own control are concerned, he offers to donate to Great Britain "all gold taken by the labour of such prisoners during the continuance of this war, above the actual cost of production." Mr. Holman argues that these prisoners must be made to earn their subsistence in order not to be a burden upon the Empire and how better could they be put to work than in being made to produce gold, which the Empire needs; and which, rather than steel, copper or lead, is ultimately going to settle things? Mr. Holman goes more into details, which need not be repeated. His argument sounds good. In effect, Britain's prisoners may be caused to win the war for her. This is almost like the all-profit and no-cost of the cat and rat farm. The *Engineering and Mining Journal* of New York reminds us that there is historic precedent for the use of prisoners that Mr. Holman proposes. The Greeks and Romans were wont to make war in order to seize men to work their mines. The revival of the idea is interesting. We wonder what the labour unions will say about it?

* * * *

The Manufacture of Zinc Dust.

One of the metal industries of the U.S.A. that has been improved by the war is the manufacture of zinc dust or blue powder, which is used as a precipitant of gold and silver from cyanide solutions, in the process of sherardizing (coating iron and steel with zinc), and in the dye industry. Zinc dust is a by-product of the zinc smelter, but only two American smelters have heretofore been engaged in producing it in commercial form. They have turned out 400 to 500 tons per annum, while we have been importing from European smelters at the rate of 2,300 to 2,400 tons per annum, says the *Engineering and Mining Journal of New York*. Before the war zinc dust was worth about 6c. per lb. Now it is about 15c. per lb. It is consequently much more profitable for the zinc smelter to make zinc dust than to make spelter. This has led the New Jersey Zinc Co. to resume the manufacture of zinc dust at Palmerton, and other smelters may do the same thing with the probable result of bringing the price down nearly to where it was in antebellum days. The reason why this business has heretofore been left chiefly to the Belgian and German smelters is that the blue powder which can most easily be put in commercial form is that which is collected in the prolongs. Now, European smelters commonly use prolongs and American smelters do not, labour being relatively cheap in Europe and dear in the United States. Although the increased recovery of zinc by the use of prolongs may be as much as 2·5 per cent. of the zinc in the ore smelted, it is considered that there is no gain in dollars and cents with normal conditions.

* * * *

Union Finances.

The *Union Gazette* of the 4th inst. gives the Finance Department's statements of Exchequer receipts and issues for the month of November and the eight months, 1st April to 30th November, 1914, inclusive. Expenditure for November was £1,394,525, and revenue £935,744, an excess of issues over receipts of £458,781. The figures for the five months, July to November, inclusive, that is, for the last month of normal peace conditions and for the first four months of war, are as follows: Revenue: July, £1,259,074; August, £1,195,610; September, £1,329,280; October, £940,390; November, £935,744. The figures for expenditure for the same five months read thus:—Expenditure: July, £1,250,063; August, £1,125,505; September, £1,139,651; October, £1,655,495; November, £1,394,525. Revenue for the four months of war has, therefore, been £4,401,024, and expenditure £5,315,176, or an excess of expenditure of £914,052.

* * * *

Electric Blasting Accident at the City Deep.

An accident unique in the history of electric blasting occurred on the Rand last Saturday at the City Deep circular shaft, resulting in the deaths of two white men and two natives, and the severe injury of a third native, whilst two other natives were badly shaken. The European victims were Messrs. R. Kenny, leading sinker, and J. Lawson, his helper. They were leaving the bottom of the shaft at 6.30 a.m. after having connected up the round of holes ready for blasting, and the sinking bucket in which they were being hoisted had reached a spot about 20 feet from the bottom when the whole round of holes went off. The force of the explosion blew the bucket and its occupants on to the platform about 50 feet above them. In the ordinary way the men would have been hoisted to the surface, and, after the usual precautions to ascertain that all the men had left the shaft, the connected holes would have been fired by the switch on the surface. The accepted explanation of the terrible accident is that a fierce flash of lightning during a thunderstorm which was raging at the time struck the ropes of the skip or the guide ropes, and that these acted as a conduit for connecting with the cable or the wires at the bottom of the shaft. This shaft is known as No. 3, the big circular ventilating shaft, and is now nearing completion. It may be remembered that in the discussion that took place some time ago on the subject of electric blasting on the Rand the possibility of accident from this cause was pointed out.

* * * *

Cyanide Position in America.

An unfavourable turn in the cyanide situation in America developed on October 24 when the cables brought news that the tank steamer *Sun* had been taken into Falmouth, England, by the British Naval authorities. After the conference in Washington it was arranged that certain needed goods, among them cyanide, should be brought out of Germany in American vessels. It was at first proposed that the 1,000 tons or more of cyanide that was awaiting shipment to the States from Rotterdam, should be brought over on the boat which was sent to bring back dyestuffs. It was impossible to secure cargo space on this, however, and Roessler & Hasslacher attempted to persuade the Holland-American Line to charter an American-owned vessel on which to make the shipment. The company was afraid to do this, however, fearing interference, and so return cargo space was finally secured on the tank steamer *Sun*, owned by the Sun Oil Co. of Philadelphia, and bound out of that port with a cargo of oil for Amsterdam. The diverting of the steamer, says the New York correspondent of the *Mining and Scientific Press*, which is American owned, by the British authorities, indicates that they are pursuing their policy of interfering with American shipping whenever there is reasonable ground for the belief that the goods on board may reach Germany. The matter is a serious one to the cyanide operators throughout America, as the Roessler & Hasslacher plant at Perth Amboy can barely meet the demands of the operators in the United States, and cannot supply any of the Mexican consumption. If it is impossible to bring this shipment through, as planned, the shortage will be seriously felt, and mine-owners are making their influence at Washington vigorously felt, so that they may secure the needed supply of cyanide. Latest American advices are to the effect that Great Britain has removed cyanide from the contraband list and permitted its export to the States.

* * * *

Dividends as Usual.

With the exception of those of the Robinson group, the dividends of the mining companies of the Rand for the half-year have all now been announced, and some outstanding features may be here briefly noted. Apart from those of the Crown Mines and Rose Deep, all the Rand Mines—Central Mining group are the same as—or better than—those for the first half of the year. The Crown Mines reduction was, of course, not unexpected, and the Rose Deep distributions for the year total 35 per cent. as against 42½ per cent. for 1913. The City Deep pays out 25 per cent. for 1914, against 17½ per cent. for 1913. The Village Deep likewise shows a notable increase from 15 per cent. for 1913 to 21¼ per cent. for the current year. The New Modder, Village Main and City and Suburban maintain the even tenour of their way at the same rates for year and each half year. Modder B. increases its December distribution to 30 per cent. making 55 per cent. for 1914 as against 45 for 1913. The Ferreira Deep, including the bonus for the first half of the year, maintains the same total as for 1913, viz., 50 per cent. Nourse Mines show a slight reduction from 20 per cent. in all for 1913 to 17½ per cent. for the current year. Bantjes rate is the same as that for the June half-year, the total for the year being 5 per cent. as against 7½ for 1913. The Durban Roodepoort Deep is again 3¾ for the half-year, making 7½ per cent. for the year an increase of 2½ per cent. on 1913, which it will be remembered was one declaration of 5 per cent. The Geldenhuis Deep figure is better than that for June and brings the total for the year up to 18¾, as against 17½ for last year. The Robinson in 1913 paid out 15 per cent. altogether and increased it to 18 per cent. this year, plus a bonus of 10s. The East Rand pays out 10 per cent. for the half-year, as against 7½ for the June period, the total being less than the total for 1913 by 7½ per cent. The Geduld makes a welcome initial declaration of a shilling per share, but the May Consolidated is an absentee. Among Barnato mines, the features are the Van Ryn Deep and Consolidated Langlaagte declarations of 25 per cent. and 20 per cent. for the whole year, as compared with 7½ and 10 per cent. for 1913—both properties, of course, only getting into their stride this year. "Knights" makes the excellent declaration of 50 per cent. for the whole year, as against 35 per cent. for 1913, the December dividend this year being 25 per cent. as against 10 per cent. at December last year. Among Neumann mines Consolidated Main Reef makes a declaration of 6¼, bringing the year's total up to 11¼, as against 10 per cent. for 1913. The Wit. Deep improves on its June figure by 2½ per cent., making the total of 1914 32½ per cent., as against 35 for 1913. Brakpan makes the splendid distribution of 17½ per cent. for the half-year, making 30 per cent. for 1914, as against 32½ for 1913. The Meyer and Charlton makes the particularly cheerful announcement of 35 per cent. for the December period, bringing the total for 1914 up to 70 per cent., as against 60 per cent. for 1913. The Van Ryn is 22½ per cent., as in June, the total for 1914 therefore being 45 per cent.; as against 47½ for 1913. The Simmer and Jack is again 5 per cent., as in June, making 10 per cent. for 1914, as against 14 per cent. for 1913. The Knights Deep is 5 per cent. likewise as in June, being 10 per cent. for 1914, as against 17½ for 1913. Robinson Deep rate is 10 per cent., making 22½ for 1914, a good increase as compared with 15 per cent. for 1913. Sub Nigel is also good, being 5 per cent. for the whole year, as against the same total for 1913. Altogether, it may be said Rand dividends have come splendidly through the first ordeals of the war, and we shall have more to add in our next issue in regard to the broad significance of that fact.

TOPICS OF THE WEEK.

QUICKENING INTEREST IN RAND SCIENTIFIC SOCIETIES.

Some remarks that recently appeared in these columns dealing with the paucity of attendances at, and lack of interest in the proceedings of, Rand scientific societies have been most courteously received by those mainly concerned, and appear already to have produced good fruit. At an excellently attended meeting of the South African Institution of Engineers last Saturday night, at which papers of unusual interest were read, the President, Mr. E. J. Way, in reply to our references, made a statement, to which we gladly give prominence. "The *South African Mining Journal*," he said, "is good enough to refer to us under a heading in their issue of the 28th ult., entitled 'What's Wrong with Rand Scientific and Technical Societies?' It is, of course, impolitic to enter into a newspaper controversy regarding the concerns of our Institution, but I think it is our duty to place before members certain facts in connection with this matter. Referring to the paucity of the attendance at the last general meeting, it was stated that even of those who contributed to the discussions, two could not attend in person, and the secretary was left with the none too easy task of deciphering their lucubrations. One of the contributors lives in Pretoria and found it impossible to attend, the other was present at a previous meeting, in order to take part in the discussion of a certain paper, and owing to the fact that discussions on other papers absorbed the whole evening, there was no time for him to read his contribution. He appeared at the meeting mentioned in the article, but having an engagement which he could not give up, asked the secretary to read his contribution. Further references are made to a prominent mine manager, who came prepared to open an impromptu discussion on a mining subject, and it was pointed out, that this was the third successive occasion on which the matter had been shelved. Reference to the agenda paper shows that this discussion could only take place if time permitted, and in no case unfortunately up to the present has time permitted at any of our general meetings this session." In reference to the remarks by us regarding the paucity of the attendance of members at the general meetings, Mr. Way quoted for the benefit of members some interesting figures with regard to the experiences of other institutions in that respect. He mentioned that the membership of the Institution of Civil Engineers numbered 9,160; of the Mechanical Engineers' Institution 6,228; of the Institution of Mining and Metallurgy, 2,290; and of the American Institute of Mining Engineers, 4,284. On the other hand the membership of the South African Institution of Engineers was at present 520, and had never exceeded 650. He added that he had some difficulty in getting authentic figures of attendances at the general meetings of other institutions, but in the November, 1914, *Journal of the Institution of Mechanical Engineers*, it was stated on p. 115 that on the 16th of October, 1914, at a general meeting 106 members were present, equal to 1·7 per cent. of the total membership. Further, he himself had been present at a meeting of the Institution of Civil Engineers, when possibly not more than 200 members were present, equal to about 2 per cent. of the total membership. At the Institution of Mining and Metallurgy, the attendances are equal to from 2 to 3 per cent., and at general meetings of the South African Institution of Engineers the attendances vary from 6 to 16 per cent. "It is true," explained Mr. Way, "that the membership of the older institution is spread throughout the world, in a far more general way than that of our own institution, but the difficulty of choosing a day and a time which will suit all members has been found to be insurmountable, in spite of many efforts made by the Council to find out the wishes of members in this respect." Similar searchings of heart have lately been exercising those responsible for the control of the Chemical, Metallurgical and Mining Society of South Africa, attended by what appear to be some tangible results, for at the last meeting of that body the President made an important announcement on the subject. *Inter alia*, he said:—"The Council have felt that attendance at recent meetings has been very far from satisfactory and, in addition, it has been very difficult indeed to get sufficient papers and business for the meetings. They have felt that it was largely due to the fact that we have too many meeting per year; one a month—12 in all, being more than most societies, at least oversea, hold. It was therefore proposed and adopted to hold only eight meetings a year. We shall have a break in the summer and in the winter; the December and January meetings will be dropped and also the June and July meetings.'' Proceeding, the President said:—

Another modification in procedure is that original papers in future, instead of being printed in galley form and distributed at the meeting as they are to-day, will be printed in the Journal and circulated before the meeting, so that at the next meeting, at which the paper is nominally presented, members who care to discuss it will, it is hoped, be ready at the meeting with their discussion. So that at that one meeting the paper will be dealt with very fully, and members who are interested in that particular subject will feel that it is worth while attending the meeting. We hope, therefore, in that way to have a much better attendance and a more interesting meeting. It follows, too, that it will not be necessary to read the paper in full, as it will have been circulated beforehand. All that will be necessary will be for the author to read a summary and elucidate such points as he may care to, and explain such diagrams as he may have brought forward with the paper. Also, the secretary will be instructed to get all the discussion possible from likely contributors to be presented at that particular meeting. The Council hopes that this will result in improving attendance and interest in meetings and therefore will be in the interests of the Society.

CONSOLIDATED GOLD FIELDS' FINANCES.

A CLOSER examination and comparison of the accounts of the Consolidated Gold Fields of South Africa than we were able to give last week show the effect of the troubles of last year. The following table speaks for itself:—

	Year ended June 30.		
	1914.	1913.	1912.
Dividends, profits from investments, etc., less amounts written off...	£421,825	£405,460	£536,944
Balance of profit ...	388,067	371,746	196,013
Preference dividends ...	150,000	150,000	150,000
Ordinary dividends ..	100,000	200,000	350,000
Do. per share ..	1/-	2/-	3/6
Taxes, etc.	6,975	11,342	10,389
Leaving	131,092	10,404	14,376
Brought in	62,516	52,112	66,488
Balance	193,608	62,516	52,112
Taken from reserve ...	150,000	1,000,000	—
Written off for year ...	259,136	1,402,201	(250,000)
Carried forward	84,472	62,516	52,112

The comparative statement does not indicate any diminution of income: for both the dividends, etc., and balance of profit are larger than the same items twelve months ago. The changes that have occurred in the company's holdings during the past year have not materially affected the general position or nature of the investments. There was no war in Europe when the company's year ended, so that it was not necessary to take any drastic step; but, in view of the unfavourable conditions now prevailing, and the uncertainty of the financial outlook after the termination of the war, the directors have withdrawn a further sum of £850,000 from the reserve fund (not shown in the table above) making £1,000,000 for the period, and leaving it standing at £800,000. As shown by the balance sheet, the following is the position. The total value of the assets, it will be seen, has fallen very considerably:—

	Year ended June 30		
	1914	1913.	1912.
Shares	£3,799,065	£4,617,807	£5,115,050
Properties, etc.	35,000	74,732	72,377
Reserve investments ..	327,642	326,581	851,927
Short loans	1,163,897	1,697,178	1,335,993
Sundry debtors, etc. ..	199,475	327,665	361,052
Cash advances, etc. ..	604,370	386,433	397,602
Cash	229,895	216,688	266,365
Total assets ...	£6,487,498	£7,840,934	£8,925,990

On the other side of the account we have:—

	Year ended June 30.		
	1914.	1913.	1912.
Sundry creditors	£742,246	£1,097,889	£1,080,082
Bills payable	—	13,000	—
Preference dividends ...	53,904	54,062	54,062
Debenture interest ...	4,512	5,178	5,826
Uncleared warrants ...	7,821	8,289	8,907
Contingent liabilities (uncalled capital on investments)	752,642	690,181	457,729
Reserve fund	800,000	1,800,000	2,800,000

Looking at the company's financial position, we find that actual cash is £229,895, against £216,688. Taking the usual items, there is an excess of cash and cash assets over liabilities of £1,389,153. The reserve fund has diminished by £2,000,000 in two years, while the investments in the same time have raised the contingent liabilities by approximately £300,000.

STOCK EXCHANGES RE-OPENING.

It was announced this week that it was the intention of the committee to re-open the Johannesburg Stock Exchange on Monday, January 4, upon such terms and conditions as to the nature and conduct of business as they may impose or determine. It was also notified that the following resolutions are now in force under the special Martial Law powers granted the Committee by the Government:—"All bargains which have matured since the Stock Exchange closed or which may hereafter mature before the Stock Exchange re-opens, shall bear interest at the rate of 8 per cent. per annum from the date of maturity until the completion of the bargain by payment and delivery, or until tender of payment by the buyer, or until seven days from the re-opening of the Stock Exchange, as the case may be. The purchaser, upon exercise of an option or call which, in ordinary circumstances, would have matured during the period the Exchange is closed, shall pay interest upon the purchase price at the rate of 8 per cent. per annum from the date of maturity. Interest at the rate of 8 per cent. per annum shall be charged on moneys paid in respect of loans of shares from the date upon which return of the shares may hereafter be tendered.'' It seems that in London the Settlement proved to have been arranged even more satisfactorily than members themselves had thought possible. Out of some two dozen cases where firms submitted their books to the Committee the number of firms that had to go into liquidation was less than ten, and all of them were very small. Futher, there has been evidence of a growing inquiry for stocks of various kinds, and what is equally welcome brokers are finding that each day brings letters from clients who are ready to pay for and take up securities which they have open. Thus the old Account is steadily being reduced. The consent of the Treasury had to be obtained before the House could re-open, but the Government did not raise any objection beyond insisting that measures are taken effectually to safeguard the country against foreign selling that might be of assistance to the enemy. It is noteworthy that on the London Stock Exchange the main restrictive conditions are: (1) Naturalised Germans and Austrians will be precluded from dealing unless they are denaturalised in the country of their origin. (2) Preventive measures against German unloading of securities and raising of money by round-about means. (3) Dealings will be for cash only. (4) Options, new time bargains and arbitrage transactions will be prohibited. The principle of fixed minimum prices will probably be extended, and in order that official action in this direction shall be the more rigidly observed, the marking of every bargain may be made obligatory instead of being an optional matter as has been the case hitherto. Dealings will have to remain, as at present, on a cash basis. Business for a time will probably be very limited owing to the restrictive provisions imposed, but the confidence engendered from the mere fact that business is to be officially resumed is an asset well worth obtaining. The safeguards devised to protect the House from the effects of enemy sales will be equally effective in preventing a bad break in prices in the event of setbacks to the progress of the Allies' cause.

TRANSVAAL GOLD MINE DIVIDENDS.

Preliminary List of Declarations for Half-Year to December 31, 1914, Made up to the Time of Going to Press,

THE following is the list of dividends for the half-year ended December, 1914, declared by gold mining companies in the Transvaal up to the time of going to press. As there are one or two announcements yet to come, the list cannot be closed until next week.

	No. of Dividend.	Per cent.
Glynn's Lydenburg	26	10
Ferreira Deep	23	25
Transvaal G.M. Estates ...	17	17½
Wolhuter	14	6¼
New Heriot	41	35
Durban Roodepoort	81	15
Village Main	28	35
City and Suburban	30	7½
Crown Mines	27	30
New Modder	17	15
Village Deep	13	11¼
Ferreira Deep	24*	25
Bantjes Consolidated	6	2½
Geldenhuis Deep	30	10
Rose Deep	27	15
Modder B.	5	30
Durban Roodepoort Deep ...	10	3¾
Robinson	45	9
Nourse Mines	21	8¾
City Deep	5	12½
E.R.P.M.	19	10
New Kleinfontein	20	5
Witwatersrand Deep	18	17½
Consolidated Main Reef ...	13	6¼
Witwatersrand	21	25
Van Ryn Deep	3	12½
New Unified	13	10
New Rietfontein	14	2½
New Primrose	43	20
Ginsberg	23	7½
Glencairn	17	5
Consolidated Langlaagte ...	3	10
Robinson Deep	24	10
Sub Nigel	5	2½
Knights Deep	19	5
Simmer and Jack	25	5
Geduld Proprietary Mines ...	1	5
Meyer and Charlton	50	35
Van Ryn	22	22½

* Bonus Dividend.

The Jumpers G.M. Co. (in liquidation) declared on 28th September, 1914 a first liquidation distribution equal to 6¼ per cent., viz.: Capital, £100,000; amount, £6,250.

COLLIERY DIVIDENDS FOR THE HALF-YEAR.

	Per cent.
Apex	7½
Breyten	2½
Natal Navigation	3¾
Transvaal Coal Trust	8¾

TIN MINING COMPANY DIVIDEND.

	Per cent.
Rooiberg	5

THE OPPORTUNITY TO REPLACE GERMAN PRODUCTS.

Further Details of Rand Chemical Supplies and Stores of German Origin—Permanganate of Potash, Lead Acetate, Manganese Dioxide and Pure Acids.

WITH reference to the question of chemicals and stores from Germany, the following interesting notes have been supplied to the Chemical, Metallurgical and Mining Society by Mr. A. Macdonald:—Permanganate of potash, which for the last ten years has been exclusively imported from Austria and Germany, is one of the principal items. The consumption of this article by the mining groups is approximately 200 tons per annum, at an average cost of £50 per ton, landed on the mine. Apart from the mining industry, this commodity is used as a disinfectant by the general public. Lead acetate: The average consumption of this substance per annum by the mining industry of the Rand and outlying districts is 700 tons. The present suppliers are Holland and France, and up to the outbreak of hostilities, Germany. Since the declaration of war, the United States have made a bold bid to secure this market. The pre-war cost to the mines from the first-mentioned sources averaged £35 per ton. American consignments are being sold at approximately £50 per ton. The worst features of dealing with the States are the slow and uncertain deliveries and the prohibitive price. The available amount of pig lead on the Continent is rapidly diminishing. In fact, acetate of lead produced at present is chiefly made from scrap lead. There is a golden opportunity for British firms interested in the manufacture of lead products. At present British manufacturers seem to content themselves with the production of white and red lead, litharge, and lead-pipe fittings. Glassware: This industry was almost entirely in the hands of Germans and Belgians. The nearest quotations from British manufacturers are not within 300 per cent. of their Continental rivals. This may be due to the unparalleled conditions existing in England to-day. Even America is 200 per cent. above pre-war prices, and this probably for German goods. The quality of the foreign article is much superior to anything produced in Great Britain. The foregoing remarks apply equally to all porcelain material, of which a considerable quantity is used on the Rand. Manganese dioxide: The average consumption of the above in the Transvaal is approximately 100 tons per annum. This is now being produced by the Cornwall mines at 100 per cent. higher price. Fine chemicals and reagents: This necessity to all chemical laboratories and assay offices, embracing chemically pure acids of which a very considerable quantity is used on the Rand, was entirely in the hands of huge German firms, such as E. Merck, of Darmstadt. The production of these chemicals seems to have been entirely neglected by British firms, who have thereby missed an opportunity of building up a lucrative adjunct to any chemical manufactory. Dyes: An enormous turnover was done annually by Germany in all aniline dyes. Foremost amongst them was the extensively used laundry blue. This industry, although originally, I believe, discovered and matured by the Mother Country, has been through excise restrictions, driven to alien shores.

PERSISTENCE OF ORE IN DEPTH.

More of Mr. T. A. Rickard's Conclusions—Lateral Exploration Cheaper and More Likely to be Successful.

THE following are further brief excerpts from Mr. T. A. Rickard's paper, read before the Institution of Mining and Metallurgy and noted in these columns last week:—" Dr. Maclaren has said that " future industry must more and more concern itself with concealed ore bodies; it is here that a universal acceptance of Mr. Rickard's proposition would prove exceedingly harmful both to the mining engineering profession and to mining capital." I refer to this remark not in any particular antagonism to Dr. Maclaren, but because I regard him as one of the foremost exponents of mining geology. If I assert that ore bodies usually become impoverished in depth and finally become unprofitable, it is not to imply that prospecting in depth is universally undesirable. But I do mean that it is unlikely that any given ore body will persist indefinitely, and that evidence of eventual impoverishment vertically must be faced in a scientific spirit. The corollary is not that deeper search must be abandoned hastily, especially in mines that are relatively shallow, but that in many cases lateral exploration, while cheaper, is also likely to prove more successful than further sinking. As regards four big mines* with which I was professionally connected, I took the view that their prospects in depth were poor, but that lateral exploration looked promising. Three of these mines were in Colorado, namely, the Enterprise, Independence, and Camp Bird; the fourth was the Commonwealth, in Arizona. Only in one case—the Camp Bird—did I consider that the geological conditions in depth were at all favourable. The Enterprise ore bodies were on a shale-gypsum contact fed by small veins that ended at this contact and were themselves impoverished within 100 to 150 ft. below that contact. My diagnosis has been confirmed. Deeper prospecting has proved futile. The Commonwealth lode is in a rhyolitic breccia lying on sandstone; when the lode reaches the sandstone it dies; the breccia-sandstone contact pitches eastward, hence the lode is productive more deeply in that direction. This interpretation of facts has been corroborated. In examining the Independence in 1898, I found that the vein on the 8th level was thin, although rich, and on the 9th level it was not worth sampling. I did not recommend the sinking of the shaft, because depth entailed departure from the particular conditions known to favour the finding of ore in this mine; on the contrary, I advised lateral exploration along and between the series of veins exposed in the workings. This proved highly successful. The shaft was sunk, several years later, to a depth of 1,400 feet, but the deeper search for ore proved decidedly unprofitable. The Camp Bird, at the time of my examination, in 1899, had a fine ore body that promised to extend westward, in which direction the contour rose so as to increase the distance to surface from 400 to 1,200 feet, affording, therefore, a block of promising ground fully 800 feet more in height. I advised exploration in that direction. The subsequent history of the mine has shown that this reasonable expectation was warranted, while the sinking of the shaft below the main adit yielded unsatisfactory results, ending in the exhaustion of the mine. My own experience has been that mine-owners often squander their funds in expensive shaft-sinking when the chances of finding ore by cross-cutting or diamond-drilling have been scarcely tested. I take issue with Dr. Maclaren when he suggests that the effort to smash a fallacious generalization is likely to prove " exceedingly harmful both to the mining engineering profession and to mining capital." The profession must recognize facts if it is to make a scientific use of current knowledge in the exploitation of ore deposits. Capital is not going to gain, legitimately, by spending money on forlorn hopes in depth, while neglecting chances in the shallow zone of mining."

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* Each of them has yielded over $10,000,000, and the four of them have made a gross output of $75,000,000.

AFRICAN AND EUROPEAN INVESTMENT.

Increasing Value of Farms—The Outlook for Stock-Breeding—Vereeniging Coal—Rhodesian Mining Interests.

The tenth ordinary general meeting of the African and European Investment Co., Ltd., was held recently, Mr. C. F. Rowell presiding. The Chairman, in moving the adoption of the report and accounts, said: The total receipts for the year amounted to £20,947, as compared with £26,202 for the previous period of fifteen months. The report on our land by Mr. W. J. Palmer fully confirmed what he had stated last year with reference to the value of their farms, and also the opinions which he then gave of various experts on that subject. It was also highly satisfactory to know that those farms were continuously increasing in value, and that, although the change was not, of course, reflected in the accounts, they might fairly assume that every year there was a hidden reserve being accumulated by the increase in value of our land holdings. With regard to the question of stock breeding, the returns of the stock now in the Union of South Africa, as compared with the stock left in the country after the Boer War, showed an extraordinary advance; in fact, the time appeared to be fast approaching which had been frequently prophesised when, in lieu of South Africa having, as formerly, to import enormous quantities of frozen meat to meet its requirements, it would become a great exporter of beef and mutton.

LAND INTERESTS.

Reverting more particularly to their land interests, before dealing with what had been done during the year in pursuance of their scheme of land settlement, he would like to draw attention to the progressive amount of revenue which they were securing from their farms. For the fifteen months ended December 31, 1912, their gross farm revenue was £4,067, or reducing that to twelve months, say, £3,254. For the fifteen months to June 30, 1913, the gross return was £5.357, or for twelve months, say, £4,286. For the twelve months to June 30, 1914, they had a gross farm revenue of £6.412, so that they would see that there had practically been an increase of 50 p.c. He did not think that when the war had been brought to a conclusion the value of their great assets would be in any way depreciated. The resources of the Vereeniging Estates Co., continued to develop in the most satisfactory manner. The coal output had now increased to over 40,000 tons per month, and was being gradually worked up to 50,000 tons per month. The very important work of developing an entirely new colliery, to be known as the Camp Pit, had been successfully carried out by the driving of a tunnel under the Vaal River, and it was proposed to equip the colliery for the production also of a minimum of 50,000 tons of coal per month, so that when this had been completed the collieries would have a joint capacity of 100,000 tons per month. The scheme for the development of the water supply of Johannesburg by the formation of a great reservoir by a dam to be erected across the Vaal River just below Vereeniging had now received the sanction of Parliament, and when that work had been carried out it would have a far-reaching effect upon the company. Then next most important interests, perhaps, were those in Rhodesia. There they owned very large interests in the Rhodesia Gold Mining and Investment Co., and in the Lonely Reef Gold Mining Co. The former company's principal interests consist of large holdings in the Lonely Reef Gold Mining Co. and in the Cam and Motor Gold Mining Co. With reference to the Lonely Reef mine, the company's engineer (Mr. C. B. Kingston) had expressed the opinion that the reef would again develop its full width and high values when a greater depth had been attained. The company had been paying regular dividends at the rate of 30 p.c. p.a. Coming to the Cam and Motor mine, the developments continue to be of the most satisfactory character, and its prospects appeared to be assured. Upon the completion of the new plant which was being erected on the recommendation of experts, there seemed little doubt that the full extraction originally estimated would be attained. Mr. J. B. Hilliard seconded the motion, which was carrired unanimously.

POSITION OF GERMAN TRADING COMPANIES IN THE UNION.

Anomalies of the Recent Proclamations—Should Payments be Made?—German Dumping After the War and the New Union Customs Dumping Clause.

THE question of trading with resident aliens is still both difficult and complicated. A pamphlet, or rather small book, published lately in England, as one of the " Ammunition for Civilians " series, and entitled " The War on German Trade," has a good deal to say on this subject, but confesses that the position is most vague and obscure. For instance, there has been nothing to prevent a limited liability company, formed entirely with German capital and controlled entirely by German directors, employing a German staff and selling German goods, from registering at Somerset House as a British company. Such companies are entitled to continue trading in Great Britain, selling their German goods and enforcing payment for their bills, provided they retain profits in Great Britain during the war, and do not remit money to Germany. Such firms can, presumably, do the same here. Ordinary German firms, not registered as limited liability companies, have merely taken a British name and carried on. The only remedy in England, is not to trade with them, new name notwithstanding. The same practice has been followed in this Union, and there is the same remedy. The book referred to calls on the Home Government to call for balance sheets and addresses of partners or directors in all doubtful cases, and where the German connection is proved, to appoint receivers, and apply moneys collected to compensation of British merchants for non-payment of Germany's debts in England. As to the all-important question of " trading with the enemy," however, the author says that:—" Unfortunately, the British proclamation left traders in the most complete darkness. Endeavours have ever since been made in vain to ascertain whether and how debts to a German firm could be discharged. Traders are receiving solicitors' letters threatening them with proceedings if they do not pay. Solicitors' opinions are being taken and sent round to merchants, pointing out that they must pay. Of what use is it to tell the commercial public that they must neither remit goods, money, nor profit to the enemy, and yet provide no means for the honourable tradesmen to discharge his debt, and assure himself that the money does not get into the hands of the enemy?" The author says, further:—" The time has come when the Treasury must give a plain British definition free from all legal phrase twisting, of the meaning of trading with the enemy. The last proclamation issued is as vague as the first, and its looseness in regard to the provision, as explained by the Attorney-General, that no offence will be committed by trading with a branch of a German or Austrian house out of Europe, or in the United Kingdom, where it can be controlled, is deplorable." According to this, a dominion branch of a German or Austrian firm may, apparently, carry on as usual, despite the war! Certainly the position is one which calls for an authoritative announcement by the Union Government as to what it is lawful to do and what unlawful. As to German and Austrian goods imported by merchants and traders before the war, and paid for, for the public to refuse to buy these is simply foolish, and unfair to these British merchants and traders. The German manufacturer will not be hit. A more important point is what is to be done after the war. The book before us states distinctly that the British people " must be prepared to see Germany literally throw millions of pounds' worth of goods into their market at prices which are less than the cost of the material. She must do so if she is to recover." Fortunately for us the new dumping clause in the Customs Tariff of the Union will prevent this.

Government Gold Mining Areas.

The following cable, which was sent last week to London, was inadvertently omitted from our last issue:—" It is estimated (that) over £18,000 (of) gold (is) absorbed and (is) in circulation in new plant."

Luipaardsvlei Estate.

During the month of November, 1914, the Luipaardsvlei Estate crushed 17,182 tons, the total profit won being £2,469.

The E.R.P.M. in November.

The following is the text of a cablegram despatched to the London office of the E.R.P.M.:—" The following are the results of last month's operations: 820 stamps milled 165,000 tons; 51,633 ozs. fine gold recovered, valued at £216,857; including 1,580 ozs., valued at £6,636, recovered from the treatment of the accumulated slime. Profit for the month, £70,004, including £5,336 profit from treatment of the accumulated slime."

MONTHLY PROFITS.

	1912. £	1913. £	1914. £
January	67,103	95,698	50,015
February	75,609	89,514	50,292
March	101,362	95,010	60,512
April	93,596	95,204	63,983
May	95,024	95,014	69,947
June	92,256	92,007	73,892
July	91,262	47,126	82,231
August	90,450	82,513	80,448
September	87,502	83,460	78,198
October	91,016	83,504	67,783
November	90,502	79,252	70,004
December	91,654	75,010	

Blasting the Cut and the Round.

ADDITIONS TO MINING REGULATIONS.

It is notified for general information that His Excellency the Governor-General, under the powers vested in him by Section 4 of the Mines and Works Act, 1911 (Act No. 12 of 1911), has been pleased to make the following addition to Regulation No. 101 of the regulations framed under the said Act and published under Government Notice No. 1922, dated the 17th November, 1911, as amended by Government Notice No. 1675, dated the 30th October, 1913:—Regulation No. 101 (3): " From and after the 1st January, 1915, no person shall blast or be permitted or caused to blast the cut and round separately on the same shift in the same development end, except under conditions approved by the Government Mining Engineer. The manager shall notify the inspector of mines of his intention to carry on such work, and shall submit draft conditions, and supply such information as the inspector of mines may require. Failure on the part of any person to observe the approved conditions shall constitute a breach of these regulations and be subject to the penalties provided therefor and to prohibition of such system of work."

The result of the " Safety First " campaign on the four railways that compose the New York Central system shows that 67 fewer employees were killed in 1914 than in 1913, a decrease of 38 per cent.; 1,646 fewer employees were injured in 1914 than in 1913, a decrease of 25 per cent.; 150 fewer persons of all classes—employees, passengers, and other persons—were killed in 1914 than in 1913, a decrease of 30 per cent.; and 2,120 fewer persons were injured in 1914 than 1913, a decrease of 28 per cent.

TRANSVAAL CHAMBER OF MINES' QUARTERLY MEETING.

Industrial Affairs Reviewed.

THE report of the Executive Committee of the Transvaal Chamber of Mines, to be presented at the quarterly meeting on Monday next, states, *inter alia*:

NATIVE LABOUR

The returns supplied by the Witwatersrand Native Labour Association, Ltd., show the following results for the months of September, October, and November, 1914: Number of natives employed by members of the Association on last day of month (including natives in the employ of mine contractors, but excluding natives in the employ of members of the Association in the districts of Barberton, Breyten, Rooiberg, Louis Moore and Orange Free State).

	September	October	November
On gold mines	169,619	170,438	166,039
On coal mines*	9,389	9,212	8,990
On diamond mines	–	–	–
	179,008	179,650	175,029

*Exclusive of certain coal mines outside labour districts.

NATIVES EMPLOYED IN LABOUR DISTRICTS OF TRANSVAAL.

The monthly report issued by the Department of Native Affairs shows that at the 31st October 240,220 coloured persons were employed in labour districts of the Transvaal. Of this number 192,168 were engaged on mines and on the various classes of works, *viz.*, chemical, metallurgical, brickmaking and other works, as defined in Part I. of the Coloured Labourers' Health Regulations, 1906, and 48,052 were in other employ.

HOSPITAL SHIP AND CONVALESCENT HOMES.

As mentioned at the last ordinary meeting of the Chamber, the sum of £30,000 has been donated to the Government by the mining companies members of the Chamber (exclusive of the Robinson group of companies), towards the provision of a hospital ship or other similar object. The Government has placed the gift at the disposal of the Official Advisory Committee on Voluntary Aid, Capetown, on which the Chamber is represented by the President. The hospital ship has now been secured by the Advisory Committee and is in commission, and part of the Chamber's donation has been expended on its equipment, the maintenance being undertaken by the Government. Under the auspices of the Advisory Committee, convalescent homes have also been established at various points in the Union. The Johannesburg Home is situated at the Wanderers, and is in charge of a Johannesburg Sub-Committee of the Advisory Committee, with the President of the Chamber as Chairman.

INCOME TAX ACT.

Since the last ordinary meeting a Sub-Committee of the Chamber has had an interview with the Commissioner for Taxes when various matters of doubt arising out of the above Act were discussed. As a result of the interview, many of the difficulties were removed, and the procedure elucidated.

INSURANCE OF GOLD UNDER NORMAL CONDITIONS.

The recommendations of the Chamber's Sub-Committee on the above subject have now been forwarded to the Chamber's London office, in order that, if possible, policies may be prepared accordingly, in conjunction with the underwriters. The policies will be of two kinds: (1) a "time" policy insuring the gold while on the mines awaiting shipment, and (2) an "open" policy effecting its insurance while en route on the way from the mines to London.

RAND WATER BOARD.

In consequence of a recent request, the Executive Committee is furnishing the Rand Water Board with statistics showing the internal water supplies available each month to the various mining companies.

VACANCY ON THE EXECUTIVE COMMITTEE.

Mr. P. Ross Frames having resigned his seat on the Executive Committee, the vacancy must, in terms of Article 41 of the Chamber's Constitution, be filled at the ordinary meeting to be held on the 21st December, 1914. In accordance with that article, Mr. Gustav Imroth was appointed to fill the casual vacancy so created, until such ordinary meeting, and is eligible for re-election.

MEMBERSHIP.

The following withdrawals from membership as from December 31st, 1914, have been notified, namely: The Simmer Deep, Ltd. Representative, Mr. C. Hely-Hutchinson. Apex Mines, Ltd. Representative, Mr. G. Sandilands.

REPRESENTATION.

The following changes in representation have taken place: Robinson Deep G.M. Co., Ltd.—Mr. A. C. Grant *vice* Mr. J. D. Low. East Rand Proprietary Mines, Ltd.—Mr. H. P. Fraser *vice* Mr. E. Callens. Aurora West United G.M. Co., Ltd.—Mr. S. Benning *vice* Mr. A. Rosendorff. New Kleinfontein Co., Ltd.—Mr. E. H. Read *vice* Mr. G. W. Higgins.

MINING MEN AND MATTERS.

Mr. Bernard Price has been elected President of the South African Institute of Electrical Engineers for the year 1915.

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Mr. F. D. P. Chaplin leaves the Rand, after a brief farewell visit, next Thursday, to take up his duties as Administrator of Rhodesia.

* * * *

His many friends on the Rand received with profound regret the news of the death of Mr. R. G. Fricker, who was for many years Joint General Manager of the Consolidated Gold Fields. He relinquished his position here in December, 1908, when he left to join the London office of the "Gold Fields" and assumed control of its West African mining ventures. His death put a large number of relatives in mourning, to whom the sympathy of the community will be extended as well as to the bereaved widow.

* * * *

The sixth annual general meeting of the South African Institute of Electrical Engineers will be held at the School of Mines Building on Thursday, the 21st January, 1915, at 8 p.m. In accordance with the Constitution and Rules, it will be necessary for all nominations for officers and Council to fill the places of those who retire at the end of the year, to be in the hands of the secretary not later than the 21st December. The retiring Vice-President and Councillors are as follows:—Vice-Presidents: Prof. W. Buchanan, Mr. Bernard Price. Members of Council: Messrs. A. E. Gibbs, F. H. Mitchell, H. Newbery, T. H. Watson, L. B. Woodworth. Associate Members of Council: Messrs. J. W. Anson, E. V. Perrow. These gentlemen are eligible for nomination either for the office of Vice-President or for ordinary membership of Council, with the exception of Mr. Bernard Price, who is President-Elect for 1915, and Mr. A. E. Gibbs, who was elected member of Council until December, 1915, but who resigns as from 31st December, 1914, as he is leaving for England.

Klipspruit Gold.

The directors' report for the year ended 30th June, 1914, submitted to the fifth ordinary general meeting of shareholders, held in the company's board room, Cullinan Building, Johannesburg, on Friday, the 27th November, 1914, at 12 noon, states, *inter alia*:—"Your company holds the freehold of a portion of the farm Klipspruit No. 8, in the district of Krugersdorp, a mynpacht covering 500 morgen and 51 prospecting claims, the mining area being equal to 771 mining claims. No mining operations have been undertaken during the period under review. The expenditure during the past year was as follows: General expenditure, of which £103 represented claim licences and mynpacht dues, £424 15s. 8d.; less owners' share of claim licences and rent, £196 10s.; net amount expended, £228 5s. 8d. To meet this expenditure, a call of 6d. per share was made upon the 9,450 preference shares (leaving 15s. to be called up) which realised £236 5s. The company had a credit balance at the bank on the 30th June, 1914, of £1 4s. 9d."

Rhodesian Section.

LATEST MINING NEWS.

Selukwe Columbia—Bushtick Mines—Anglo-French Matabeleland—Rhodesia and the War—United Rhodesia Gold Fields—

The annual general meeting of the Selukwe Columbia Gold Mine, Ltd., was held in mail week at 8, Old Jewry, E.C. Mr. H. L. Stokes presided and moved the adoption of the report for the year ended June 30 last. It was proposed, he said, to pay a dividend of 15 per cent., absorbing £21,037, leaving £8,163 to carry forward. The result of development work carried out on the acquired Wonderland properties had been encouraging. The new reduction plant was expected to be working by the early part of the coming year. The report was adopted.

* * * *

The accident to the crank shaft of the large gas engine at the Bushtick in September last necessitated considerable reduction in the tonnage crushed monthly, as well as hindering the treatment of the ore. This reduction of tonnage, together with the rise in the prices of mining stores and the reduction in the price obtained for gold won, has caused the Board of directors to consider it advisable to temporarily suspend milling operations. The development in the lower levels of the mine has shown up well. The lode has become more silicious and slightly more pyritic. On the 5th level of the Warwick section the lode assays 28s. per ton over an average width of 82 inches, the width of the drive, for a length of 600 feet. The face is still in average value. It is anticipated that the average width in stoping will be about 10 feet. Development on the 6th level is now being continued. The last sample across face of drive assayed 78·5s. per ton over 60 inches. The ore here is similar to that in the level above, but will not present any difficulty in treatment. The Board has recently obtained a report from a leading consulting engineer who considers that the total working expenses, including redemption of development, will not exceed 12s. per ton, and the extraction will be from 90 to 95 per cent. In consequence the profit to be earned will be good. It is the intention of the Board to add to the present equipment on the property by providing a central power plant to generate power cheaper than the present plant is capable of, and of increasing the capacity of the mill.

* * * *

The eighteenth annual meeting of shareholders in the Anglo French Matabeleland Company, Limited, was held in London recently. Mr. F. A. Robinson presided, and moved the adoption of the report and accounts for the year ended May 31 last. He said there had been only a very moderate demand for land during the year. The Company had sold a small parcel of 280 acres on the West Gwelo block at 13s. 9d. per acre, and on the East Shangani block they had sold 7,617 acres at prices varying from 10s. to 15s. per acre. These prices showed a satisfactory advance upon those realised in the previous year. The policy of the Board was not to press sales, nor to accept every offer that came along and they got a good many offers from time to time. They were of opinion that land in Rhodesia was more likely to increase in value than otherwise, and, moreover, they were desirous of having settlers of the right sort on their property, men with reasonable resources, and who intended to settle down and make their homes on the place. The Directors were well satisfied with those they already had, and they believed this policy would pay the Company in the long run. Their land holdings at May 31, i.e., at the end of their financial year, amounted to 329,508 acres, or 515 square miles. This land was taken into their accounts at £51,630, which was a little over 3s. per acre. It seemed obvious, therefore, with the more favourable conditions to which they might look forward after the war, that a very substantial profit might reasonably be anticipated. The profit shown in the Company's books on the sale of the 7,897 acres was £3,000, but, as he explained last year, they were only allowed to take a portion of this into their profit and loss account.

* * * *

Speaking at the annual meeting of the Anglo-French Matabeleland Co., Ltd., the chairman said:—It is, perhaps, too soon to express an opinion as to the effect the war will have upon Rhodesia in the future. The immediate effect is similar to what it is in the rest of South Africa, and the dominions generally, namely, that every citizen of this great Empire is anxious to do his little bit, whatever it may be, in this great struggle. South Africa has been the subject of the basest intrigues on the part of our enemies, but with one accord the people of South Africa, the British and the Dutch alike, have risen magnificently to the occasion in a manifestation of loyalty which has, I venture to say, never been excelled in the history of the British Empire. The rebellious element, the coterie of traitors, will be stamped out, and from this cataclysm will undoubtedly arise a United South Africa such as those of us, who, like myself, have known South Africa for more years than we care to reckon, have ever dared to hope for. The inhabitants of Rhodesia are doing their share. Our manager, writing some weeks ago, said that a large portion of the male population had joined the defence force, and it was announced a few days ago that the first Rhodesian contingent for service against German South West Africa had left Salisbury, while a second contingent is now being recruited. A Rhodesian contingent was also offered to the Imperial Government, and, failing its acceptance, many Rhodesians have come over on their own account to enlist. The inhabitants of Rhodesia are also subscribing liberally to the relief funds. In the meantime that business must suffer goes without saying, but we shall look forward with confidence, knowing that there can only be one end to this great struggle, and that in the long run it must be to the welfare of the British Empire, and to that potion of the Empire in which this company's particular interests lie. In conclusion, I desire on behalf of the Board to express our appreciation of the manner in which the company's affairs have been administered in Rhodesia by our manager, Mr. Umson, to whom our thanks are due. I now beg to move: "That the report and accounts as submitted to this meeting be and are hereby received and adopted," and I will ask Mr. Archibald Little, who lately visited the company's properties, to second the resolution.

* * * *

The report of the directors of the United Rhodesia Gold Fields, Ltd., for the year ended July 31, 1914, states that 120 claims have been abandoned and 10 sold, leaving 609 claims at July 31 last. Development work on properties during the year was 2,741 ft., making a total at July 31 of 61,318 ft. Just-in-Time Gold Mining Co.—A further 10 claims have been sold during the year to this company, for which 1,000 fully-paid shares have been received. The shares have been taken into the books at £1 per share and the £1,600 credited to purchase of property account. If conditions are favourable, it is intended to start development in the early part of next year. In addition to the reef which previous work has exposed, large quantities of payable rubble are known to exist, which will probably be treated with a small mill. King's Daughter and Violet.—In August, 1913, the King's Daughter tributers ceased milling, and have since confined their operations to the treatment of the accumulated slimes. Hibernian.—A considerable amount of work was done on this property, but the results were indefinite, and it was considered advisable to discontinue costly development for the present. The property is now under option of tribute to certain parties, who are continuing the development work. Mayo (Rhodesia) Development.—The position is very satisfactory, but owing to the ruling financial conditions the shares are quoted at a very low figure, viz., $\frac{5}{8}$. This nominal quotation accounts for the great part of the depreciation referred to in the auditors' report, and should be entirely recovered in normal times. Inez Gold Mining Co.—The tributers commenced in January, 1913, and from that time until July 31, 1914, they have obtained the following results:—Tons milled, 9,672; fine gold, 2,799 oz.; value, £11,746; royalty paid, £606. Considering the heavy work of reopening the mine to the 6th level, the alteration and retimbering the main shaft and repairing and renewing machinery, the work of the tributers has been most satisfactory. The 7th level is about to be opened up, and prospects are certainly encouraging at depth. Simoona Development.—Two blocks of claims on this property have recently been let on tribute, but no reports are yet obtainable. Rhodesia Lands, Ltd.—The land sales during the year to December 31, 1913, have been satisfactory, 11,547 acres having been sold for £11,565, making the total sales to that date 79,315 acres for £64,158, averaging 16s. 2d. per acre. Agricultural work is confined to the Borrowdale Estate, upon which there are now over 2,000 acres of cultivated land. Two other large estates, comprising a total acreage of some 70,000, are occupied by cattle. The company's cattle holding at December 31, 1913, was 2,449 head. Mr. C. E. Parsons, the consulting engineer, says: "All the company's claims have been examined and reported upon. A number of worthless blocks have been abandoned, as they otherwise involve an expenditure from which we cannot expect to derive any profit; others will fall out of the list as time goes on. The Jumbo Mine has continued crushing, though in the present condition of that mine we cannot expect it to last much longer." The accounts show a loss, after providing for debenture interest, depreciation, etc., of £16,197, reducing a credit balance brought forward to £2,503. The investments at cost are: £7,000 Barbados 3½ p.c. inscribed stock, £7,568; £5,000 Cape of Good Hope Consolidated 3 p.c. stock, £4,556. Shares and debentures in other companies are: Cam and Motor, 11,750 shares of £1 each, fully paid; Central Panhalanga, 31,645 shares of £1 each, fully paid, and 29,600 shares of £1 each, 7s. 6d. paid; Golden Kopje Proprietary, 37,934 shares of £1 each, fully paid; Hay Gold Mining, 1,350 shares of £1 each, fully paid; Inez Gold Mining, 59,607 shares of £1 each, fully paid, and £14,200 6 p.c. first mortgage debentures; Jumbo, 10,108 shares of £1 each, fully paid; Just-in-Time Gold Mining, 5,004 shares of £1 each, fully paid, and 3,996 shares of £1 each, 3s. paid; Lonely Reef, 1,520 shares of £1 each, fully paid; Mayo (Rhodesia) Development, 94,687 shares of £1 each; Rhodesia Lands, 55,007 shares of £1 each, fully paid; Samoona Development, 21,800 shares of £1 each, fully paid; Southern Rhodesia Mining, 1,800 shares of £1 each, fully paid, and 300 shares of £1 each, 10s. paid; Zambesia Exploring, 416 shares of £1 each, fully paid, and £5,742 5½ p.c. debentures; also sundry shares in other companies. The auditors say: "The published prices at July 30, 1914, of such of the shares and debentures in other companies as had published prices (about three-fifths of the whole) showed in the aggregate a deficiency of about £64,000. The remainder are included at the directors' estimate. We are not able to verify the value of the properties and a part of the sundry debtors."

Rezende Mines.

The results for the month of November, 1914, are as follows:—Estimated profit: Central Section, £2,066; Old West Workings, £491; total, £2,557.

The Johannesburg Sharemarket More Active.

SOME UNOFFICIAL PRICES.

The Johannesburg market was fairly active this week in all classes of stocks, the announcement with regard to the re-opening of the Exchange next month being well received. In a few instances advances were recorded. At the opening, Modder Deeps were quoted at 58s. 3d. (buyers), sales eventually taking place at 58s. 6d. Van Ryn Deeps were bought at 45s. 9d., City and Suburbans at 46s. 6d., Apex Mines at 13s. 6d., State Mines at 22s. 3d., Kleinfonteins at 20s. 9d., Springs Mines at 12s., Con. Main Reefs at 17s. 6d., Sakalava Oils at 20s. 6d. Modder B.'s improved to 83s. 6d. (buyers), but the quotation failed to attract sellers. New Modders were also bid for unsuccessfully at £12 10s. Business during the afternoon consisted of sales of Knight Centrals at 6s., New Eras at 5s. 3d., Wolhuters at 12s. 3d., City and Suburbans at 46s. 3d., and Sakalava Oils at 20s. East Rand Proprietarys advanced to 31s. (buyers), and Zaaiplaats Tins to 21s. 3d.

9.30 to 1 p.m. Thursday.	Buyers.		Sellers		Sales.	
	s.	d.	s.	d.	s.	d.
African Farms	9	3	9	5	.....	
Apex Mines	13	6	......		13	6
Frank Smiths	1	6	......		......	
Crown Diamonds	1	6	.....		.....	
E.R. Deeps	1	3	.....		...	
Roodberg	18	9	...		...	
Rand Deeps	3	0	...		...	
Modder Deeps	58	3	58	9	58	6
Knight Centrals	5	10	....		......	
New Eras	5	0	5	3	...	
East Rands	30	0	......		...	
Consolidated Langlaagtes	33	0	....		.....	
Lace Props	2	6	....		...	
State Mines	22	3	22	6	22	3
New Kleinfonteins	20	6	21	0	20	9
City and Suburbans	46	3	46	6	46	6
Wolhuters	12	3	12	6	...	
S.A. Lands	2	2	2	4	...	
New Modders	£12½		....		..	
Cloverfields	3	11	..		.	
Sub-Nigels	9	0	10	0	...	
E.R. Centrals	2	1	2	3		
Van Ryn Deeps	45	6	46	0	45	9
Brakpans	47	6	50	0	...	
City Deeps	56	3	....		......	
Ferreira Deeps	45	0	.....		......	
Empire Diamonds	1	9	....		......	
Zaaiplaats	21	0	....		...	
Springs Mines	11	9	12	0	12	0
Crown Mines	87	6	. .		...	
T.G.M. Estates	36	3	..		.	
Village Deeps	36	0	37	0	.	
Main Reefs	17	3	17	6	17	6
E.R. Coals	...		1	9	...	
Sakalava Oils	20	0	21	0	20	6
Gedulds	19	9	.		...	
Phoenixs	0	6	.		.	
Coronation Syndicates	.		2	6	...	
West Rand Estates			2	3	.	
Modder Bs.	83	6	...		....	
New Unifieds	17	6	.		...	
Rand Nucleus	1	4	1	6	..	
Romola Nigels	0	4	....		.....	

2 to 5 p.m.	Buyers.		Sellers.		Sales.	
	s.	d.	s.	d.	s.	d.
Knight Centrals	5	10	......		6	0
New Eras	5	1	5	3	5	3
Wolhuters	......		......		12	3
Sakalava Oils	......		......		20	0
West Rand Estates	1	0	1	6	......	

Robinson Group.

In November the Langlaagte Estate and G.M. Co. milled 48,288 tons; the total yield was 14,182 fine ozs.; and the estimated profit £16,045, or 6s. 7·75d. per ton milled. At the Randfontein Central 208,437 tons were milled; the total yield was 57,282 fine ozs.; and the estimated profit, £70,305, or 6s. 8·95d. per ton milled.

Progress in Zinc Ore Reduction.

In the muffle process of zinc reduction, writes Dr. Nagel in *Metall. und Erz,* progress has been confined to innovations in the introduction of temperature, partly by improved generators and recuperators, and partly by a better adjustment of the heating and combustion gases; but successful efforts of rather considerable importance have been made to improve the treatment of zinciferous residues. For instance, at the Hans Heinrich works at Langelsheim, the erection of which was completed in the course of the year, a waterjacket shaft furnace of ordinary type has been adopted for smelting slag averaging about 14 per cent. zinc, 1 2 per cent. Cu. and 1·6 to 3·5 per cent. Pb, with coke as flux. The resulting copper-lead regulus, which would also hold any precious metal contents of the slag, is treated in the usual way, while all the slag containing zinc oxide which overflows from the forehearth is conveyed direct into reverberatory furnaces, where the zinc is eliminated by lime and carbon at a temperature of about 1,500 deg. C. The results are stated to be satisfactory. As regards electro-thermic zinc recovery, it cannot yet be said to have reached a stage where it can be regarded as a serious competitor of the old muffle process. Before that could come to pass further great improvements to prevent loss of metal and excess of zinc dust generation, as well as in condensation and power consumption, would have to be made. Among the various electro-thermic processes adopted in Europe the Côte-Pierron method is stated to give satisfactory results at the Ugine works in Savoy, where its employment is greatly facilitated by exceptionally favourable local conditions. At Trollhättan, in Sweden, and Sarpsborg, in Norway, several thousand tons of spelter are yearly produced by the electro-thermic process, and although the work cannot yet be considered economically satisfactory, it is stated that the results obtained in August, 1913, and later have been so much better than in previous times that the outlook for the future is regarded as most satisfactory. In America particular attention has been devoted to direct smelting in the electric furnace of simple as well as of complex zinc ores without preliminary or preparatory reduction processes, but, so far, all attempts in this direction have given more or less disappointing results. It is considered, however, that the definite solution of the problem is now well in sight.

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MANAGERS - - - January and May - - - ALL Passed.
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MECH. ENGINEERS- June (Kimberley Centre) - - ALL ,,
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Correspondence and Discussion.

Comments on Questions Arising in Technical Practice or Suggested by Articles in the Journal—Views, Suggestions and Experiences of Readers.

Oil in South Africa.

To the Editor, *South African Mining Journal.*

Sir,—My attention having been drawn to the Geological Survey of the Union and its oil prospects; also to a letter which appeared in your journal in July last on the petroleum deposits of South Africa and their value to the Empire. It is interesting to persue the geological survey and the contributions that have appeared from time to time on the question of petroleum and the oil shales of South Africa since Mr. Cunningham Craig's visit, and to be told where such minerals have been known to exist in the Provinces of the Transvaal and Natal many years before the Union Government engaged an expert of life-long experience to visit the country to report and investigate into the various propositions of petroleum and oil shale possibilities put forward. I question if some of those gentlemen who criticise the expert's report informed the Government of their knowledge where petroleum and petroleum-bearing shales or their indications were known by them at the time of the expert's visit. We are told this: "That direct traces of oil were found by me (Mr. Cumming) high up on the Drakensberg, not only were films of oil found floating on the surface of the still waters, but bubbles of gas, also, that two beds of black-shale exist on the spur of the mountain, and on the southern range two seams of oil shale, each 12 inches thick, 150 and 175 feet respectively below the undermost coal seam. He tells us further: "He has so far only made hurried inspections and tests under unfavourable conditions, but wherever he applied the latter in the majority of trials he met with distinct encouragement." The same writer goes on to say: "It is clear therefore that supposing the wide valley carries the oil shales uniformly the district ought to carry millions of tons of payable shale." Such being the case there was the more reason for his putting his discovery before the Government and expert. The expert's opinion would then have been obtained and embodied in his report as to the value of the traces of oil, also as to the probable quantity and quality of the two 12-inch seams of oil shales, and if they were likely to continue across the wide valley, which I, for one, doubt very much by the description given as to their position in the horizon. The same writer had the privilege of travelling with the expert and the other Government mining and geological officials, and was present in several of the districts where the oil shales were carefully inspected, but not a word, so fas as we are told, did our friend inform the Government or Mr. Graig as to his discovery. Instead, he conceals his knowledge until Mr. Craig has gone many thousands of miles elsewhere to perform his other arduous duties, our friend now comes forward and informs the world, through your widely-read journal, of his enormous extensive and valuable find, as it must be by the contribution to your journal in July last on the Petroleum and Oil-Shales of South Africa and their value. Your correspondent in that article was prepared to disabuse the mind of the Honourable Sir Edward Grey on the question of oil supplies, and where they could be found in South Africa to supply the whole world. Sir Edward Grey, when addressing the members of the British Parliament (as stated by our friend) on the important subject of petroleum supplies, the honourable gentleman regretted to have to inform his colleagues that sufficient quantities of oil could not be obtained in the Dominions. Our well-versed friend came to the honourable gentleman's assistance through the columns of your journal, and makes the following manifesto:—"It is my pleasant task to disabuse the mind of the right honourable gentleman of any such erroneous idea, and inter alia, to give to the whole British Empire, and especially to South Africa, some information upon this, to-day, most vital subject which shall prove to demonstrate that right here in South Africa has utterly failed to recognise that she has enormous supplies of petroleum-bearing shales, such supplies in fact would suffice the whole world." If anyone knew where such great quantities of petroleum-bearing shales were to be found in any part of the Union that would supply the British Empire with her requirements of petroleum, let alone the whole world, they would be performing a noble service to their country to let it be known. He then would be recognised by the nations of the world as one among those specially skilled in such minerals. If such finds had been put before the Government at the time of the expert's visit, no doubt they would have been inspected and reported upon as to their quantity and value with those other places where people had imagined oil and oil shales had been found. I have serious doubts as to our friend's knowledge of such great quantities of either petroleum or petroleum-bearing shales that would supply the British Empire and her Dominions with her requirements of oil, let alone the whole world's demands. He might have given the public some authentic information as to the world's output of petroleum and its requirements, also the quantity of South African shales required to be produced daily to supply such a demand, but not a word are we told as to this. I have not the world's present-day production or requirements, but one is safe in putting it at about 50 per cent. more to-day than it was ten years ago (about the time I came to this country). Let us look back to the year 1904, and what do we find. The world's production of petroleum that year was stated to be 8,760,000,000 gallons, and the imports into England for the same period was about 300,000,000 gallons in addition to her own production, which amounts to an additional quantity of 64,000,000 gallons. (The figures are here given in whole numbers.) Has our friend, whose task it was to disabuse the mind of the Hon. Sir Edward Grey, and set at ease the British Empire as to where her and the world's supplies of petroleum could be found and produced, ever for one moment considered what the required output of South African shales would reach (either in time of peace or war) to supply the quantity of petroleum in 1904? If not, it was his duty to do so, and to supply the public with some genuine information. The figures as above stated showing the world's production of petroleum in 1904 are taken from the United States Geological Survey, and the figures of imports into England and her own production for the same period are copied from the Home Office Board of Customs Returns. Supposing we prove to the public of South Africa and show beyond doubt the daily quantity of South African petroleum-bearing shales that would require to be mined and manufactured to produce the world's output of petroleum in 1904, using the above figures as a basis for calculation, which figures we have no reason to doubt as to their correctness. Let us assume a South African shale 3 feet thick every portion of it suitable for distillation without waste, and to produce not less than 4 gallons of crude oil per ton of shale, which is an exceedingly high average. Taking this average of oil, South Africa would require to produce an output of 600,000 tons of shale daily, seven days per week, to manufacture by distillation the quantity of petroleum required in 1904. This extracting from the bowels of the earth about 100 acres of this valuable mineral daily without allowing for faults, wants and supports left in the workings. When the world's requirements were as above stated in 1904, what must it not be at the present day (assuming the nations of the world at peace) with all the large Dreadnoughts and other ships of war and mercantile marine, with other machinery on land and sea built and remodelled during the last ten years to use oil instead of coal. Your correspondent further criticises Mr. Craig's report, and states:—"It is necessary to South African exporting and industrial welfare to demonstrate the fallacies of Mr. Craig's conclusions." And to verify this fallacy he informs us that Mr. Craig has to admit on page 24 of his report this: "That the presence of sufficient carbonaceous material from which oil be formed has been proved in the Transvaal strata." That does not say there are sufficient to supply the whole world's requirements of petroleum. What Mr. Craig actually reports is as follows:—"Whatever theory may be held as to the origin of petroleum three points have to be considered, viz.: (1) The presence of sufficient carbonaceous material from which oil can be formed; (2) the condition of deposition; (3) the geological structure. In a locality where those three conditions are favourable an oil field can be predicted with certainty. In the Stormberg series of Cape Colony, Natal, Basutoland, the first condition is fulfilled. The Transvaal and Natal lower horizon (Beaufort series) also furnishes sufficient raw material." When Mr. Craig penned those words he was speaking of natural petroleum. Reading Mr. Cumming's passage as quoted by him would lead the public to believe that when sufficient carbonaceous material was present in quantities natural oil would be found. This is not so. There may be sufficient carbonaceous material spread over wide areas that would yield oil by distillation, but it is essential if we are to obtain natural petroleum that the strata be petroliferous, therefore whatever theory scientists and eminent geologists hold as to the origin of petroleum the conditions absolutely necessary to produce oil must be observed, otherwise there is no hope of obtaining that which we all desire to see, an oil reservoir. The seepages of oil found floating on the surface of the still waters on the Drakensberg do not assist in defining petroleum to be of commercial value, or the thin shales on the same mountains and valleys are hardly reasonable to prove that flowing wells of oil would be found there to help in supplying the world's demand. We have been told quantities of oil have been found trickling down the face of the newly-broken rocks, and several bottles of oil have been collected. I have rock stone from which, when first broken up, the oil could be seen dripping, but even that is no indication or assurance that natural petroleum will be found in quantities. The heat from the instrusive rocks would distil the carbonaceous matter in whatever form it was held in the strata throwing off gas and oil to a limited extent. The hollow spaces, creek and cavities of the rock becoming filled with viscous hydrocarbon, and by pulling up the rocks and applying a light they would give off a lively flame. Hugh Miller, in his Lectures as early as 1855 on "The Testimony of the Rocks," mentions that the flagstones of Caithness when put on a fire burned as if they had been steeped in oil. This is what he tells us: "That there were found in the neighbourhood of Stromness about fifteen years ago by Dr. John Fleming a curious non-decript vegetable organism which, though equi-vocal in character and appearance, was in all probability a plant of the sea. Their individual members must have been very great. The immensely developed flagstones of Caithness seems to owe their dark colour to organic matter, mainly of vegetable origin, so strongly bituminous indeed for some of the beds of dingier tint that they flamed in the fire like slates steeped in oil." Withal there were no oil wells. Dr. Fleming's discovery was made eight or ten years before the manufacture of paraffin oil was first established by the late James Young from natural petroleum found oozing from the sandstone in one of the coal mines in Derbyshire, England, which industry only lasted a short time, when it became exhausted. This all goes to prove that something more than sufficient carbonaceous material is necessary before natural petroleum can be expected in large quantities and over large areas. I can also point to an oil-shale district on an extensive anticline where a sandstone of about 60 feet thick was quarried for building purposes, but by and bye the quarry had to be abandoned, the stone deteriorating on account of the crude oil oozing to the surface of the stone sometime after being built and exposed to the weather. Films of oil were seen floating on the surface of the water in the quarry. Trial openings were made, and drills put down on the expectation of encountering oil gushers, but no more oil was met with than that first observed. Also crude oil was found in one of the shale mines at Broxburn, where a constant oozing of petroleum was seen, and from which eight to ten thousand gallons of natural petroleum was collected and sent to the refinery. The cavities and fissures of the rocks were filled with soft wax, which melted in the sun and spread in an oily film over the stone. The division of the mine from where the petroleum was collected was only a few feet higher in the horizon than a good oil shale which was not effected or disturbed, and although the mine was placed on an extensive anticline with sufficient carbonaceous material present to form oil no more petroleum was obtained than that above mentioned, showing that it requires something in addition to sufficient carbonaceous material or an anticlinical structure or the observation of seepages of oil on the still waters or it trickling down the cavities by distillation from the intrusive rocks to produce reservoirs of petroleum. Over three years ago a company was drilling in the Ladybrand district of the Free State for natural petroleum. I happened to be in their office when the mails arrived from South Africa bringing the favourable report that the indications of petroleum in the bore-hole were good, and oil was expected to be tapped at a depth of about 4,000 feet. On this point my opinion on the prospects was asked for by the chairman and directors, I having been in the district. I told them my estimation was although they continued drilling to a depth of 40,000 feet no oil would be met with. Mr. Craig has since visited and reported on the same proposition, bearing out my remarks. I am also one of those who maintain that no natural petroleum of commercial value will be found on or near the Drakensberg, whatever our friend may say to the contrary.

The expert is next attacked unreasonably for not taking samples from the underlying shales of the 8ft. seam, and this is what we are told by Mr. Cumming :—" Mr. Craig never troubled to take samples from the underlying shales, which have since been proved to be true oil-bearing shales." What are we to understand by a true oil bearing shale? Is it one that contains oil independent of its richness and quantity, or is it a shale that contains sufficient quantity and quality as to make it a commercial and profitable enterprise beyond the problem of speculation? I had already told Mr. Craig the thickness and value of those underlying shales according to measurements and analysis, and Mr. Craig reports on page 23 : " Distillation, I am informed, has yielded an average of six gallons per ton of heavy oil, and a fair amount of inflammable gas." Such a statement going out from the pen of an expert correspondent of Mr. Cumming's calibre that Mr. Craig never troubled to take samples of those shales leads the public to believe that the expert penetrated the subject and work in a shallow, outward manner. More especially will the public believe so when the writer informs us that he accompanied the expert on his examinations: this being so, he was well able to testify as to the way in which the inspections of shales were carried out. Mr. Cumming and the other gentlemen present during the inspection of those particular underlying shales were well aware, and well able to judge, why samples of the 8ft. thick seam in the shallow shaft were not taken or obtainable. Why? Because that part of the seam in the shaft had not been broken up or sunk through, and in addition the underlying shales there were covered with water at the time of the expert's visit, which was well known and observable to all present.

We are further told there are other two bands of shale on the same property, in addition to the 8ft. thick seam already mentioned, making three seams in all, aggregating about 20ft. of shale. It would be interesting if we had been informed what proportion of the 20 feet had been "proved to be true oil-bearing." The information given in our friend's correspondence would lead one to believe it was all oil-bearing. There are many thick bands of shale in the Provinces of the Transvaal and Natal that carry no oil. I am told fifteen tons of those shales were shipped to England some time ago to be practically tested, as suggested by Mr. Craig on page 27 of his report. It would be interesting to know what proportion of the three seams was sent, and with what results. It is also stated by the same author between brackets : " Be it here noted I am only quoting Mr. Cunningham Craig in order to show his contradictions and inconsistencies, and to prove from his own report how wholly superficial was the nature of his investigations." I have carefully read our friend's letter and Mr. Craig's report, and I fail to see where the author proves or shows a single fallacy, contradition, inconsistency, or a superficial nature of the expert's report or investigations.

We must admit Mr. Cumming had an opportunity of testifying to the expert's work and inspection, and the way in which the nature of the investigations were carried out, that few gentlemen had outside the Government officials. He had the pleasure of travelling with Mr. Craig over several, if not all, of the oil-shale fields and districts—at least those inspected in the Transvaal and Northern Natal—and in addition had several personal interesting interviews with the expert on the subject of petroleum and petroleum-bearing shales during their travels, and whatever Mr. Cumming may now say as to the fallacies of the expert's conclusions and the superficial nature of the investigations and examinations made, Mr. Cumming in his own words and with his own pen (unless that particular pen led him astray) writes the following, which appeared in the *Heilbron Herald* on Friday, 8th August last. Hear what he says : " In the quest for oil or liquid fuel, Mr. Cunningham Craig, accompanied by Mr. Trevor, Inspector of Mines, Pretoria, and Mr. Kynston, Chief of the Geological Survey Department of the Union, paid a visit to the Bethel, Ermelo, Piet Retief, and Wakkerstroom districts last week and the week previous. They reached the oil-shales area on the 22nd July, and inspected Kikvorschfontein No. 4, and on the following day they gave attention to Winterplaats and Spruitfontein, which are the northernmost farms in Natal. The shales of the first-named were carefully examined by all three officials, the oil expert particularly devoting keen and careful scrutiny to the work. The writer was courteously favoured by Mr. Craig with a brief but not the less interesting interview. The party of geological talent next inspected the farms Winterplaats and Spruitfontein. The same careful attention to the deposits was given by Mr. Craig as on the previous day. Mr. Craig, while walking over the farm, very courteously tendered me some useful advice as to the indications of petroleum." The above is proof from Mr. Cumming's own pen as to the careful penetrating investigation made by the expert in the different districts. In spite of what is written above, our friend goes on to prove to the public "how wholly superficial was the nature of the expert's investigation and examinations." Here is a gentleman who travelled with the expert and enjoyed his hospitality and conversations, and wrote highly of the manner in which the expert carried out his duties, now turning round to show to the world how wholly superficial was the nature of the work performed. Was there ever a greater contradiction of statements than this, writing praises with the one pen and condemning them with the other?

At the special request of the Government official for the district I met the expert and pointed out the shales on the farms here referred to in Northern Natal, and being present can speak with confidence as to the care and attention and to the interest taken by the expert on the propositions put forward in that district, and it gives me pleasure to testify to, and to corroborate, Mr. Cumming's remarks as to the careful, prudent attitude adopted by Mr. Craig in the performance of his investigations, inspections, and enquiries as to the nature and values of the shales, whatever may be said now by others to the contrary. I will pass over the remarks as to the relative values between the Transvaal oil-shales and those of Scotland, as time and space will not admit me going fully into the question, but with all due respect to the analyst I will make bold to state they will come far short when fully and practically worked. I will now enter into the question of the thin shales of Scotland and their working, and point out the erroneous statements made regarding the profitable working of those shales. Mr. Cumming informs us Mr. Craig admits that "a 17in. seam is *profitably* worked at Broxburn, a 20in. seam at Addiewell, a 24in. seam at Oakbank, and 11 inches at Levenseat."

The above is Mr. Cumming's way of putting it. Mr. Craig puts it thus : " In Scotland a 17in. seam *was* worked, together with a 2ft. seam of coal at Broxburn. The 'grey shale' at Addiewell was 1ft. 8in. in thickness, and the 'wee seam' at Oakbank 2ft. thick, while immediately above the Levenseat limestone a seam 11 inches was worked. Thin seams, however, are not worked now." None of the thin seams of Scotland have been worked for many years, and it is questionable if some of them were ever much worked. At any rate, work done in some of those thin seams was during the early days of shale mining before the thick seams were known in some districts, and when burning oil, which was then the oil sought after, was selling about 3s. per gallon. The Levenseat shale never was worked by itself as an oil-shale proposition. It forms the roof of the limestone of that name, which is, if I recollect aright, about ten or eleven feet thick, the shale coming down with the working of the stone, and before it was known to contain oil was put to the side of the workings or sent to the dump as debris. About the year 1860 the only use made of it was to roof outhouses and piggeries. It was very suitable for this purpose, being obtained in large flags of several feet. Many such buildings can be seen standing to this day with Levenseat shale coverings. On or about the year 1864, when it became known that this 11in. band of shale contained oil, a small distillation plant was established, and the work of distillation continued until the year 1870, when they were abandoned. Mr. Craig is quite correct in stating "thin seams, however, are not worked now," and have not been, I should say, for nearly thirty years. Has our friend ever had experience in working thin seams of either coal or shale and their costs of production? If not, I have, and can safely say such seams cannot be worked at a profit unless under very unusual and favourable conditions, even although the undercutting be performed by machinery. I should very much like to see natives go into a thin seam of shale lying between two rocks, or even a machine, and produce a profitable day's work to the employer. We have been told of a thin seam of shale of about 14 inches thick which carries 60 gallons of oil to the ton against a 60in. seam carrying 25 gallons. What would you prefer to have or work? The undercutting, whether done by manual or mechanical labour, would be as 1 is to 56. Assuming an undercut of four inches, which undercut material would be of no use for the retorts on account of its fineness, and for equal square yards of ground cut there would be about 75 gallons of oil in the one case against 140 gallons in the case of the thick seam, sp. gr. being equal. I should not have taken any notice of Mr. Cumming's letter were it not for its uncalled-for attacks made on a gentleman who may be thousands of miles away, and may not have the opportunity of reading or replying to his critic's notes; also the expert being a Government servant, at least while here, may prevent him from replying or taking any notice of the observations and remarks made, however willing and able he may be to correct same.

Natal. JAMES MALCOLM.

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Engineering Notes and News.

Patents and Alien Enemies.

Applications have been lodged in London for the avoidance or suspension of the following patents:—

A patent granted in the name of Gebrüden Hinselman for jig conveyors; E. Mills, 9 Harper Street, Willenhall, Staffordshire, applicant; to be heard on November 5th.

A patent granted in the name of Julius Pintsch A. G. for apparatus for flashes of light; Pintsch's Patent Lighting Co., Ltd., Friars House, New Broad Street, London, applicant; to be heard on November 6th.

A patent granted in the name of Julius Pintsch A. G. for railway signalling; Pintsch's Patent Lighting Co., Ltd., applicant; to be heard on November 6th.

A patent granted in the name of Julius Pintsch A. G. for lighthouse lamps for aerial navigation; Pintsch's Patent Lighting Co., Ltd., applicant; to be heard on November 6th.

The following case has been decided:—

A patent granted in the name of "Vulkan" Maschinenfabriks Akt.-Ges.; Glenfield & Kennedy, Ltd., applicant; application refused.

Electrical Progress in Portuguese West Africa.

The American Consular representative in the Belgian Congo has recently made a tour of Portuguese West Africa, and drawn up a report on the industrial and agricultural pursuits of that colony generally, and also on opportunities of increasing the sale of manufactured goods. Amongst the limited number of manufacturing enterprises the electric light and power plant at Catumbella is of interest as being the first electrical plant on the whole west central coast of Africa. It is a British enterprise, holding a concession from the municipalities of Lobito, Benguella, and Catumbella for the supply of light and power for ninety-nine years. The growing importance of Lobito, on account of the Benguella railway, of which it is the terminus, makes the concession a valuable one. The street lighting of the three towns has been successfully inaugurated, and negotiations have been started with the Benguella Railway for supplying light and power on the company's wharves, stations, workshops, etc. A good return is also looked for in supplying current for electric fans and electric pumps for irrigation and house water supply. The company supplies incandescent lamps at about 4s. each. The duty on lamps is 25 per cent. *ad valorem*, and there is a 30 to 40 per cent. breakage. Portugal supplies about 60 per cent. of Angola's imports, though in reality a considerable part of the amount credited to the mother country is of other origin. These include goods from many sources bought from wholesale houses in Lisbon, and entered as Portuguese manufactures. The United Kingdom has always held second place as a supplier of Angola's wants, but other countries are actively cultivating the market. In Loanda four or five German firms have complete exhibits of every sort of goods suitable for the Angola trade, every article being labelled with the price, freight, duty, etc., in Portuguese currency. By these thorough methods German trade has been rapidly increased, in some cases to the detriment of British firms, who are more conservative, but nevertheless, says the Consul, far more active than American competitors. The Germans have been operating not only in Loanda, but, as a rule, in all the larger towns along the West Coast, and some of them even on the East Coast. Catalogues and correspondence should be in the Portuguese language, or at least Spanish. The prices and terms of sale should be stated fully, together with approximate freight rates. The precautions usual in packing goods for tropical countries should be exercised. Iron manufactures should be well greased, and leather goods wrapped in oiled cloth. Outside cases should be strongly constructed of thick boards, and care should be taken to secure them with a sufficient number of iron bands and straps, so that they will resist the rough handling of various transhipments.

Prieska-Upington Railway.

SOUTH AFRICAN CONSTRUCTION RECORD.

The railway from Prieska to Upington—a distance of 142 miles—which was authorised under Act 2 of the Special Session of Parliament held in September last, was completed on the evening of the 18th November (says the "S.A. Railways and Harbours Magazine"). This establishes a record for railway construction work in South Africa, and having regard to the circumstances under which the work was constructed, it will, we think, equal, if not surpass, anything that has yet been accomplished in the direction of rapid railway construction at a comparatively small expenditure. The line was built departmentally by the Railway Administration, under the supervision of Mr. N. K. Prettejohn, Resident Engineer. It is laid with second-hand 60 lb. rails and wooden sleepers (1,760 to the mile), and the maximum gradient, compensated for curvature, is 1 in 66. There is one fully-equipped station on the line, at Draghoender, and also twelve sidings. The estimated cost was £2,250 per mile, and it is hoped to come out within the estimate. The speedy construction of a railway line from Prieska to Upington was considered necessary to facilitate the movement of troops towards the German South-West border and to admit of assistance being rendered in the field with the greater promptitude which rail communication would afford. Prieska, which was the nearest point on the Union Railways to the German South-West border, is about 220 miles distant, and it was felt that the construction of 142 miles of railway over country in which road transport presents great difficulty, owing to the sandy nature of the roads, would be of material advantage to the Defence authorities in the conduct of military operations. It is primarily a strategical line, but it will at the same time be an important line in opening up the north-west districts of the Cape Province, in encouraging the cultivation of the rich agricultural areas in the vicinity of the Orange River, and in promoting the development of the mineral resources of the districts which it serves.

Fraser & Chalmers.

The report of Fraser & Chalmers, Ltd., for the year to June 30 states that the profit, after providing for all expenses, interest on loans and depreciation, was £8,377. The dividend of 7½ per cent. on the preference share capital was paid on July 25. The Directors recommend that the balance of profits be carried forward.

HIGH MINING SALARIES

For those holding Certificates as Mine Managers, Mine Surveyors, Mine Captains, Mechanical and Electrical Engineers and Engine-Drivers. Private Individual Tuition and Correspondence lessons where personal tuition is impossible. Practical Mathematics and Electrotechnics.—E. J. MOYNIHAN, Consulting Engineer, 35 6, Cuthberts' Buildings, Box 2061, Johannesburg.

NOTES ON TRANSFORMERS.*

MR. J. W. KIRKLAND contributed the following at the November meeting of the South African Institution of Engineers to the continued discussion of Mr. A. E. H. Dinham-Peren's paper, "Notes on Transformers":—

Mr. Kirkland said that Mr. Dinham-Peren's paper might perhaps better have been entitled "Notes on Transformers for Lighting and Power Purposes," since of course there are many types of transformers which are not touched on in his notes. For example, current and potential transformers for the operation of electrical instruments; high tension testing transformers for the purpose of subjecting apparatus and cables to electrical stresses; constant current transformers with floating secondary coils for the operation of devices requiring constant current rather than constant voltage. Mr. Dinham-Peren has touched somewhat lightly on the question of transformer oil, and it may be of interest therefore to supplement his remarks with some more detailed information with respect to modern practice in this respect. The choice of suitable transformer oil depends to a great extent upon the ultimate temperature for which the transformer with which the oil is to be used is expected to reach. For water-cooled transformers and oil-cooled transformers intended to operate with a temperature rise of 40 deg. C. or less, the following characteristics are satisfactory: Flash point, 135 deg. C.; burning point, 150 deg. C.; freezing point, -50 deg. C.; viscosity at 40 deg. C., 42 seconds; colour, very pale amber, clear. For oil-cooled transformers which are expected to operate with a temperature rise exceeding 40 deg. C., the following characteristics should be demanded: Flash point, 160 deg. C.; burning point, 175 deg. C.; freezing point, -10 deg. C.; viscosity at 40 deg. C., 60 seconds; colour, pale amber, clear. It will be noted that these specifications call for an oil resembling that designated "light" in Mr. Dinham-Peren's paper rather than the medium. Modern practice is decidedly against an oil having the characteristics given in Mr. Dinham-Peren's column headed "medium" for the reason that in such an oil viscosity is sacrificed to high flashing and burning temperatures. Fluidity is of very great importance because upon that characteristic depends the amount of circulation of oil through the interstices of the transformer windings. Flashing and burning points are second in importance only to viscosity, and it is desirable that the flashing point shall always be higher than the maximum temperature to which the transformer can attain. In addition to the characteristics mentioned above, it is essential that transformer oils should be free from acids, alkalies and free sulphur. Acidity has a very injurious effect on insulation, while free sulphur is transformed into sulphuric acid and attacks the copper windings themselves. Mr. Dinham-Peren's figures with respect to specific gravity are not in accordance with most modern practice, which, as I have stated, is towards lighter oils. The oil which I have referred to above as being suitable for transformers of 40 deg. C. rise and less should have a specific gravity of approximately ·83, while the oil which I have mentioned of higher flashing point may have a specific gravity of about ·85. The following notes as to the practical methods of testing transformer oil may be of interest:—

Cold Test.—The cold test is determined by cooling a volume of oil with a thermometer immersed in the centre. The temperature at which the oil ceases to flow on slightly tipping the receptacle is called the cold test.

Flashing and Burning Points.—A cup is filled with the oil to be tested and a suitably calibrated thermometer is suspended near the centre. The temperature of the oil is gradually raised and every half-minute or so a small gas flame is brought close to the surface of the soil. The temperature at which a flash of burning oil vapour passes completely over the surface of the oil is the flashing point. The burning point is the temperature at which after flashing the oil continues to burn.

Viscosity.—The Saybolt Viscosimeter consists of a tank 7 inches in diameter within which is a cylinder 1¼ inches diameter and 4 inches high. The internal cylinder is provided with an overflow cup which can be drained by means of a pipette. The large tank is filled with water at about 40·6 deg. C., and the internal cylinder with oil at 39·5 deg. C. A thermometer is placed in the oil, and when the temperature reaches 40 deg. C. the thermometer is removed and the oil from the overflow cup is drained off. This ensures the correct volume of oil in the testing cylinder. Then the cork which is in the bottom of the testing cylinder is removed and the oil flows through a standard orifice (·076 inch diameter) of the cylinder into a flask placed directly underneath. The time required to fill this flask to a fixed level is called the viscosity.

Sulphur.—The presence of free sulphur is detected by immersing a bright copper rod in the oil and then heating the oil to 85 deg. C. The presence of sulphur will be indicated if the copper is blackened.

Sludging.—Good transformer oil will show no precipitate when heated to 120 deg. C. for 72 hours with pure oxygen bubbling through

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*Contribution read before the South African Institute of Engineers.

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it. Mr. Bernard Price has referred to the desirability of excluding air from contact with transformer oil. This is not practicable in connection with many types of large high voltage transformers, and other means must be adopted for preventing the deposition of water inside of the transformer case. The following notes with reference to transformer breathing, as it is called, may be of interest in this connection: The subject of breathing is becoming more important on account of the use of a large number of outdoor transformers. In such cases, especially where the load varies considerably, there is likely to be considerable condensation from the entrance of outside moist air unless some preventive measures are taken. Breathers filled with chloride of calcium have been used for such installations, and we believe have been effective, but in the majority of such cases with which we are familiar the breathers have not been kept supplied with chloride, so that they serve merely as vents. In one installation the chloride was purposely left out of the breathers, and after service covering more than a year, during which examinations were made from time to time, it was found that such an arrangement is apparently just as effective as when chloride is used. The theory of the breather is to afford a quick outlet for air which is taken in when the transformer is operating at low temperature. Since it is not practical, nor advisable, to make a transformer air-tight, it follows that air will enter the transformer at low temperatures and be expelled at high temperatures. If it has no easy means of egress its moisture condenses before it is expelled and runs into the oil. It has been found that a simple breathing space protected from the weather is sufficient to prevent condensation so long as the temperature of the oil is above the temperature of the outside air. In other words, for transformers constantly in circuit the use of chloride breathers is unnecessary, although a free breathing space should be provided. Such breathing space need not be larger than 1 inch or 2 inches in diameter. Where large high voltage transformers are cut out of circuit for any considerable time, some provision should be made to keep the temperature of the inside air moderately high and nearly constant. Conditions which would give rise to condensation in such transformers would be a warm, moist day following a cold period during which the entire mass of the transformers had reached comparatively low temperatures. In such cases chloride breathers are not sufficient protection against condensation, while the use of small heating coils inside of the transformer, above the oil level, consuming from 100 to 400 watts, dependent upon the size of the transformer, has been found to be entirely successful in taking care of the worst conditions. In extremely cold climates it is desirable to use some method which will prevent the oil from freezing. In such case transformers, which may have their low tension coils temporarily connected so as to give part core loss on excitation from the low tension circuit of the active transformers, may be kept warm in this manner with very little expense and no additional apparatus. If the windings cannot be so connected, it may be possible to under-excite them from some other source. In large installations it may become advisable to purchase additional step-down transformers to provide such source. As to the amount of heat necessary, a good general rule to follow for cold climates is that dissipation of the heat equivalent to approximately half of the core loss of the transformer (if water-cooled) and full core loss (if self-cooled) is sufficient to prevent freezing and condensation. Of course when the transformers are kept warm by excitation of the windings, it is not necessary to provide the special heating units referred to above.

New Patents.

402. Seguin Fisher, c/o P.O. Box 668, Johannesburg, Transvaal.—Water connection for rock drills.
403. Stanley Nettleton, c/o P.O. Box 668, Johannesburg, Transvaal.—Improvements in means for ventilating mine working and the like.
404. Oliver Trevillion Jenkins, c/o P.O. Box 668, Johannesburg, Transvaal.—Improvements in rock drilling tools with detachable cutters.
405. (1) The Thomas Transmission, Ltd., of 14 Leonard Place, Kensington High Street, in the County of London, England; and (2) John Godfrey Parry Thomas, of 21 Ennismore Avenue, Chiswick, in the County of London, England.—Improvements in and connected with the driving of road vehicles.
406. Thomas Kempley Irwin, of 5 London Wall Buildings, in the City of London, Kingdom of England.—Improvements in, or relating to, hydro extractors or like centrifugal machines.
407. Thomas Quig Ryan and Hilda Morgan.—Paving material.
408. Frank Rumph.—Burst tyre clip.
409. Frederick Stubbs. A new or improved toy or amusement device.
410. John Emery Bucher.—Improved electrical process for producing cyanides.
411. Henry Alexander Stenning and James Hamilton Stirling Improvements in and relating to super-heaters, especially applicable to locomotives.
412. Robert Maclaurin.—Improvements in or relating to the manufacture or production of gas, oil and ammonia.
413. Jackson Stewart.—Improvements in alarm clocks and attachments therefor.
414. Philip Cuthbert Phippen Booty.—Improved valve device for air gas machines.

The World's Copper Supplies.

Since the commencement of the twentieth century nearly eight million tons of copper have been extracted from their ores, and have been consumed in the chief manufacturing countries of the world. The value of this metal, at an average price of £60 per ton for the whole period, is £480,000,000, or nearly two-thirds of our National Debt. Mr. John B. C. Kershaw, writing in a contemporary, suggests the probability that within the next twenty years the "known" ore reserves of the existing mines will be worked out, and that unless new ore deposits of vast extent are discovered, copper will become one of the rarer and most costly metals before half the century is passed away. By that time some other metal or alloy will have been found to serve equally well the purposes for which copper is now used. Will this metal be aluminium

New S.A. Companies Registered in London.

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12th August. £100,000, in £1 shares. Business: To acquire estancias, ranches and sheep and cattle farms or any interest therein on land adapted therefor, in Africa or elsewhere, to carry on the business of breeders of and dealers in horses, cattle and sheep, farmers, graziers, tanners, corn and forage merchants, etc. The signatories are: W. R. Chapman 73 Crowborough Road, Tooting, London, S.W.; S. F. C. Strachan, 41 Battersea Rise, Clapham Common, London, S.W. (one share each). Private company. The first directors are not named.

SOUTH AFRICAN TRADE AND THE WAR.

Questions Now Under Discussion.

In the report of the Executive Committee of the Johannesburg Chamber of Commerce, submitted to the last monthly general meeting of members, the following matters arising out of war are discussed:—

OCEAN FREIGHTS.

In reply to the Committee's representations, the Secretary for Finance notified that a telegram was despatched by the Treasury to the High Commissioner in London stating that, in view of recent naval developments, the Government considered that the remaining war surcharges on South African freight should now be withdrawn. Also, that anything short of complete withdrawal would provoke serious and, in the Government's opinion, justifiable criticism in commercial circles in this country. The Committee further pointed out to the Treasury that the surcharge of 33⅓ per cent. on coastwise rates is still maintained, and submitted that such charges are unjustifiable and are very prejudicial to the due maintenance of South African trade. In reply, the Treasury states that the Government continues to urge on the Union-Castle Company the withdrawal of this surcharge.

GOVERNMENT PRODUCE SCHEME.

The Committee understands that this scheme is now in operation and that holders of produce can obtain the benefits of its provisions.

WAR RISK INSURANCES ON WHEAT AND FLOUR.

The scheme for insuring wheat and flour against King Enemy War Risk continues to work satisfactorily, and has undoubtedly been of much value in maintaining due supplies for this country.

LOOTING BY REBELS.

A Special Committee has been appointed to consider this question and to interview the Government in order to explain the position and ascertain what policy will be adopted in regard to losses sustained at the hands of the rebels.

CONSIGNMENT GOODS FROM ENEMY COUNTRIES.

Following on correspondence with the Chamber on this subject, the Treasury issued Notice No. 1868 in the *Government Gazette* of the 13th of November, setting forth the Government's requirements. It will be seen that the disposal of these goods is not permitted unless the net proceeds are deposited in the Union Treasury for custody; further, all holders of such goods, on the 4th of August, or subsequently, are required to furnish the Treasury with the particulars specified in the Government Notice.

CARGO IN ENEMY VESSELS AT NEUTRAL PORTS.

The Secretary for Finance has issued to the Association of Chambers of Commerce a copy of a communication from the Colonial Office stating that the Board of Trade have suggested that British owners of cargo in every such vessel should, so far as practicable, take concerted action with a view to the recovery of the cargo and should instruct local agents at the various ports to make the necessary arrangements with the captain of the vessel for its release. The Secretary of State for Foreign Affairs has intimated that when necessary His Majesty's Consul will be prepared to recommend an agent or, if none is available, to act himself. In any case His Majesty's Consuls will do all in their power to protect the interests of British owners of cargo on board these vessels.

TRADING WITH NON-BELLIGERENT COUNTRIES.

Attention is called to the notice to importers and exporters which appeared in the *Government Gazette* of the 28th November setting forth the requirements of His Majesty's Government in respect of all goods imported into or exported from the United Kingdom in trade with any foreign port in Europe or on the Mediterranean or Black Seas, with the exception of those of Russia, Belgium, France, Spain and Portugal.

RAILWAY MATTERS.

Earnings.—The following is a summary of the approximate earnings of the South African Railways for the forty-eight weeks ended at 28th November, 1914, as compared with the actual earnings for the corresponding period of the previous year, viz.:—

	1914. (48 weeks.)	1913. (48 weeks.)
Passengers	£2,931,160	£3,049,808
Parcels	319,319	329,796
Goods	5,011,600	5,574,738
Coal	1,719,153	1,736,173
Livestock	383,736	354,038
Miscellaneous	308,978	306,931
Totals	£10,673,951	£11,351,484

In the course of an address delivered in mail week, before the Royal Society, Sir William Crookes, the President, mentioned the curious fact that diamonds exposed to the action of radium become highly radio-active, and that this activity continued for years with apparently undiminished force. Sir William produced a diamond which had been exposed to radium for some months, about twelve years ago. After the exposure it was found to be highly radio-active, and affected a photographic plate. Though it had never been near radium since, it was now practically as active as ever, in spite of the fact that it had been carried about in his pocket and subject to the drastic treatment of being boiled in strong acids.

Village Main Reef.

The secretaries write:—With reference to the recent fall of rock due to an earth tremor, advice of which was recently published, we beg to inform you that the following cable has this day (14th December) been forwarded to London: "Normal milling resumed to-day."

The Sheba.

The following are the results of operations at the Sheba mine for the month of November, 1914:—Crushed 6,600 tons, yielding 2,828 ozs.; estimated profit, £3,915.

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Commerce and Industries.

Delagoa Bay Development.

The twelfth ordinary general meeting of the Delagoa Bay Development Corporation, Ltd., was held in London recently. The Chairman, proceeding to move the adoption of the report for the year ended June 30 last, said the accounts themselves called for no particular comment beyond some explanation of the capital expenditure for the year, amounting to £5,124. The amount expended on the water supply was £2,002, the greater part of which was the cost of laying an 8-in. bye-pass main in the river Matolla, so that in the event of a breakdown on the 16-in. main laid in the river the supply to Lourenco Marques would be carried on without interruption through this bye-pass. The amount expended on the electric tramways undertaking was £1,768, mainly on power plant and new offices at the power station. The balance of £1,354 was expended on alterations to the Capitania building and other smaller items.

* * * *

Condensed Milk Industry for South Africa.

In September last the Committee of the Durban Chamber of Commerce wrote to the Treasury proposing that Government should invite attention to the question of establishing a condensed milk industry in the Union and observing that they did not suggest the offering of a public subsidy to those who might establish such an industry. In his reply, the Secretary for Finance stated that he is advised that the condensed milk industry is a business of a highly specialised nature, requiring a large capital and special knowledge, in addition to which there are usually trade secrets and patents involved which would further increase the difficulties. He enclosed a report prepared by the dairy expert, Mr. Challis, and added that if Mr. Challis was correct in his information regarding the tentative inquiries that have been made by the world's two largest producers, the time might be opportune for approaching them and pointing out the local advantages, the large oversea importation, etc. In view of the remarks contained in Mr. Challis' report, advantage might be taken to urge the suitability of Durban as a prospective site for factories. If facilities for the acquisition of land could at the same time be offered, no doubt the representations would receive careful consideration. The committee propose to pursue this subject further at a later date, when business is more settled, and capitalists may be expected to consider the proposition.

* * * *

German Industries Suffering.

German industries are feeling the effects of the war more keenly as time goes on, says *Engineering*, owing to the closure of all exports, the diminished home demand and, for those special branches which, through war requirements, otherwise might be kept well employed, the shortage of skilled labour and the rise in prices and scarcity of certain raw materials. Reduced output and a material reduction in the number of employees are the order of the day; thus, the production of coal has gone down 50 per cent. compared with the corresponding period last year. Unemployment is on the increase, and much disappointment is being experienced at no public funds having been voted under this head, although the Diet the other day, amongst other big grants, voted 400,000,000 marks for the aid of sufferers from the war in East Prussia. Apprehensions as to the future have already shown their very pronounced effect in the direction of dividends recently declared by large industrial concerns for the last financial year. Several have found it advisable to reduce their dividends as much as 10 per cent. below last year's, amongst them some large firms in the iron and mining industry; the greatest disappointment has perhaps been caused by the Allgemeine Elektricitats Gesellschaft stepping down from 14 to 8 per cent., 10 per cent. having been reckoned upon in any case. Germany and Austria, naturally, are exerting themselves to substitute home made plant for such formerly imported from England. Thus, the Government some time ago made a request to German manufacturers of spinning and weaving machinery to go in for the manufacture of such specialities, which, before the war, were imported from England. This advice, it would seem, has already borne fruit; thus some large engineering firms in Alsace and elsewhere are said to be already making machines for fine yarn, which fully compensate for the English machinery formerly used. Some of the Chemnitz manufacturers are understood to be turning out fully satisfactory plant for flax, hemp, and jute spinning, etc. The Konigs and Laurahutte is another example of how seriously the war affects industrial concerns in Germany. The dividend for the year 1913-14 has been fixed at only 4 per cent. against 8 per cent. for the previous year. The profits certainly were somewhat smaller (3,553,828 marks, against 4,854,058 marks); but it transpires from the report that it is chiefly concern for the future which has influenced the dividend. About 33 per cent. of the hands and staff are in the war, the railway service is out of gear, bad debts may be expected, and the Polish iron works of the company had to be stopped almost directly the war broke out, without any prospects of re-opening.

* * * *

Union Finances.

The Treasury statement of Union revenue for the eight months ended November 30 gives the total exchequer receipts on revenue account as £9,205,152, as compared with £10,329,424 for the corresponding period of last year, the shortfall being £1,124,272, all of which loss may fairly be attributed to the effects of the war and the rebellion. Customs and Excise yielded £2,970,335, as against £3,627,209, a drop of £656,874. Posts, telegraphs, and telephones earned £1,078,246, as against £1,081,633, the difference being only £3,287; while Inland Revenue yielded £5,156,471, as against £5,620,582, showing a decline of £464,111. Loan recoveries were £151,240, as compared with £200,789, the shortfall being £49,539. The statement also shows the following receipts: Union of South Africa 4 per cent. loan, 1914, £1,316,000; Union of South Africa debenture issue, 1914, £3,500,000. £78,000 of the latter amount was received during last month, and the temporary loans raised amounted to £6,281,000, of which £207,000 was raised last month. The statement of issues on revenue account shows £1,394,525 for November, and a total of £11,237,992 for the past eight months of the financial year, the latter figure comparing with £10,813,384 for the corresponding period of last year. The estimates for the year 1914-15 totalled £16,813,612. It will be observed that, although the issues on this account exceed those of the corresponding period of last year by rather more than £400,000, the rate of expenditure works out at the same amount per month as that anticipated by the estimates. The issues on loan account included £2,000,000 for war expenses, of which £1,026,583 was debited to the November account. Temporary loans repaid amounted to £5,584,500, which leaves some £696,000 outstanding. Comparing the revenue receipts with the issues on revenue account, the expenditure in November exceeded the income by £458,781, while for the past eight months the excess was just over five millions.

* * * *

War and the Cotton Trade.

For some time past Lancashire's great textile industry has demanded more and more of the suitable raw material for her highly developed machinery and organisation. Praiseworthy efforts have been made, especially by the British Cotton growing Association, to promote cultivation throughout the Empire to meet the deficiency. Now the conditions are reversed, and a gloomy outlook arises from the fact that there is a glut of the raw fibre. The United States and Egypt have had exceptionally good crops, and India is likely to have a similar experience. Last year the Balkan unrest, among other circumstances, closed some markets for finished goods and threw a considerable quantity of stocks on the manufacturers' hands; and the present

European conflict has enormously aggravated the threatening features of the situation. As a consequence widespread stagnation has occurred, mills are shutting down or working half time, and unemployment is rapidly growing throughout Lancashire, which is so largely dependent on the cotton trade and complementary industries. The twin evils to be combated are the blow to Lancashire trade, and the discouragement of cotton growing, particularly in the Empire, through inability to dispose of this year's crops. Remedies have been suggested on all hands, bearing on questions of finance and insurance of crops, free marketing and readier facilities for cabling. In Egypt amelioration is to be attempted by compulsory reduction of the planting of cotton and the substitution of cereal cultivation. But the most radical policy is likely in this instance to be the safest and the best. No one, says *United Empire*, can speak with greater knowledge of the sensitive conditions of the trade, and with a better record of work for the extension of Imperial resources, than Sir Charles Macara. Much weight therefore attaches to the proposals he is putting forward. He advocates the intervention of the British and American Governments, as those most interested, to steady the price of cotton (which has rapidly fallen lately) by the purchase and storage of superabundant crops now, and by the future control of supplies to manufacturers, until such times as the revival of the consuming markets or a year of bad crops shall restore the balance between supply and demand. The problem must be dealt with at once; ordinary methods of relief cannot be applied to such a delicate and intricate business as the cotton industry. It is probable that a solution may be achieved somewhat on the lines advocated by Sir Charles Macara, whose views carry conviction from his position as Chairman of the Cotton Spinners' Association, and from his great Imperial and international reputation.

* * * *

Manufacturing in Germany.

Some information has just become available in regard to two companies in Germany. The first is the Siemens & Halske Co., whose financial year ended on July 31st, which is said to have been a very favourable period. It is uncertain what deliveries will be effected in connection with the large orders which have been accepted in the current year, as the company has numerous relations with hostile countries. During the early weeks of the war old contracts were frequently cancelled, and the stock of orders for various non-warlike manufactures immediately declined. The work of manufacturing was not inconsiderably restricted through the mobilisation, and operations in all departments are declared to be fully maintained to the extent of this limitation. It is intended to take into account the change in circumstances by the provision of a war reserve fund in the preparation of the balance sheet, which will still occupy attention for several weeks. The directors of the Allgemeine Elektrizitäts Gesellschaft had under consideration the accounts for the financial year 1913-14 at a meeting held on October 29th. After defraying general expenses, taxes, interest on loans, and making the customary provision for depreciation, and also in view of the state of war, the accounts indicate net profits amounting to £944,000, as contrasted with £1,445,000 in the preceding year, the total being derived solely from manufacturing. It is proposed to pay a dividend of 8 per cent. on share capital of £7,750,000, this rate comparing with 14 per cent. in 1912-13. The directors add that the company has a banking credit of £3,850,000, as a year ago; that both the invoiced turnover and orders on hand in the new financial year show a further increase; and that it cannot be foreseen at present to what extent the foreign orders included in the orders on the books will reach the stage of delivery.

Sakalava Madagascar Proprietary Oil Fields.

The secretary writes:—We have received the following cable from the company's engineer and field manager, Mr. S. A. R. Skertchly, M.Inst.M.M., M.I.M.E.: "Number three well seven hundred and twenty feet deep in bituminous sandstone."

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THE SOUTH AFRICAN

Mining Journal,

WITH WHICH IS INCORPORATED

South African Mines, Commerce and Industries.

ESTABLISHED 1891.

VOL. XXIV., PART I.] DECEMBER 26, 1914. [No. 1213.

HEAD OFFICE: 176-180, Stock Exchange Buildings, Fox Street (2nd Floor), Johannesburg, Union of South Africa.

Telephone **913.** P.O. Boxes **963** and **418.**

Cable and Telegraphic Address: **"MINING JOURNAL."**

AGENTS FOR GREAT BRITAIN: Argus Printing and Publishing Co., Ltd., Byron House, 82-85, Fleet Street, London, E.C.

AMERICA: Advertisements accepted from any recognised Advertisement Agency.

ANNUAL SUBSCRIPTION RATES: Oversea, £2; South Africa (by post), £1 10s.; Local Delivery (Town only), £1 6s.

Copies of this journal are obtainable at all Branches and Agencies of the Central News Agency, Ltd., at all News Agents and Railway Bookstalls throughout South Africa, and at the London Agency as above.

NOTICE.—The postage of this issue of the *S.A. Mining Journal* is: South Africa, 1d. All other parts, 2d.

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Notes and News.

Christmas as Usual. As this issue appears on Christmas Eve, we take the opportunity of wishing all our readers a happy Christmas and a New Year more prosperous than the present one. We have also to acknowledge cards from several public bodies, and cordially reciprocate the kind sentiments expressed. As the year closes the clouds seem to lighten, and from those two local barometers of business activity, the Stock Exchange and the Commercial Exchange, most cheerful reports are to hand. It is too early yet for the new feeling of hope and confidence to translate itself into an actual increase in the volume of business, but there is much to be thankful for in the fact that the prospects for the re-opening after the holidays are excellent.

* * * *

The Year's Dividends. Not all the usual dividends for the second half of the year have yet been declared, and in the circumstances we hold over our usual table until the totals may be compared. Most of the dividend features were dealt with in this column last week, and it now remains only to point the moral of the whole. And that, of course, is plain enough. Rand directorates have loyally withstood all temptations to "put on a poor mouth" and "conserve resources" in face of threatened new taxation. By declaring dividends as usual, and in several cases better than usual, they have done a service to the credit of the Union and of the mining industry.

* * * *

New Taxation. There is a cryptic reference to further taxation by the Union Government in the speech made by Lord Harris at the annual general meeting of the Consolidated Gold Fields, and there is no doubt that the Government is casting about for ways and means to meet the extraordinary expenditure of the day. The rumour of a land tax on farms not beneficially occupied is again raised, and it is believed that the bill dealing with the matter which was shelved when brought up last year will be re-introduced at the coming session of the Union Parliament. It is also whispered that the Income Tax may be increased, thus fulfilling the prophecy of those who all along regarded the present Income Tax as merely in the nature of a feeler. The noble example set by the Home country will, however, encourage us all to pay whatever fresh imposts may be required with equanimity.

* * * *

Cinderella Consolidated. At a meeting of the debenture holders of the Cinderella Consolidated Gold Mines, Ltd., held recently in London, an extraordinary resolution was passed postponing for a period expiring twelve months after the signing of peace of the payment of the interest represented by the coupon falling due on the 1st prox., and those falling due between that date and the expiration of such period, and also assenting to the postponement for a like period of the redemption of the debentures.

* * * *

Ferreira Deep Position. In this issue will be found a very full and informing record of the progress of the Ferreira Deep in the twelve months ended September 30 last. Particular interest centres in the report of Mr. Percy Cazalet, the consulting engineer, who deals in detail with the position of the mine, its performance during the year and its immediate prospects. Mr. Cazalet's report is so complete that it leaves little in the way of comment to be added. He discusses with great frankness the underground conditions peculiar to the mine, and he shows how strenuous and—despite the recent set-back—how successful the efforts have been to put the deep level section of the property in a sound condition. The old Ferreira Outcrop is now practically at an end, and work is being concentrated on the deep section. The reports, of course, do not cover the recent subsidence, the effects of which, we are glad to learn, were speedily overcome. Indeed the excellent engineering work put in by the manager, resident engineer and staff agreeably surprised the Government Mining Engineer and his staff of inspectors. No shareholder should miss the consulting engineer's report in this issue, which is all that such a report should be—full, lucid and informative.

* * * *

The Industry as Usual.

Referring to the progress of the mining industry in the present difficult times in the matter of essential supplies, the President of the Chamber of Mines said on Monday: "At our last quarterly meeting I commented on the extraordinarily happy position in which this industry is situated, and I need only say on this occasion that that position is maintained. There seems to be every reason to anticipate that the needs of the industry as regards its supplies will be satisfactorily met. As regards the disposal of our gold, it is only necessary for me to say that the very satisfactory arrangements to which I referred at the last quarterly meeting are being continued."

* * * *

The Bantjes Trouble.

The secretaries write, under date 21st inst.:—We beg to advise that the following cable has been despatched to London for publication:—"As a consequence of the recent heavy rains a portion of the main shaft in soft ground and dyke near the outcrop collapsed on Saturday last. Owing to this part of the shaft being supported by steel 'setts,' the repairs would take longer than would be the case were it timbered; it may be anticipated that the output will be interrupted to a considerable extent for several weeks. This is especially unfortunate, since the grade and recovery position, which was bad last month, had returned to normal some time before the accident took place."

* * * *

A Successful Colliery.

The Breyten Collieries have had another successful year, though, of course, there were difficulties to contend against. Summing up the position, Mr. D. Christopherson, who presided at the annual meeting, said:—"After much care and trouble the company can now be said to be free of debt and in a sound position underground, but our contract prices for supplying coal are low, and any increase in costs naturally affects us more than where collieries are getting better prices." A full report of the proceedings at the annual meeting appears in this issue.

* * * *

How the Industry is Helping.

In connection with the Hospital Ship and Convalescent Homes, to which a gift of £30,000 has made to the Government by the Chamber of Mines on behalf of its members, for the provision of a hospital ship and other relief work in connection with the sick and wounded, Mr. Wallers announced at the meeting of the Chamber of Mines on Monday:—"This gift is being administered by a Government Committee, namely, the Official Advisory Committee on Voluntary Aid, on which the Chamber is represented, and a portion of it has been expended on the equipment of a hospital ship, the maintenance of which will be undertaken by the Government. The Voluntary Aid Committee is expending a further portion of the gift in equipping convalescent homes at various points in the Union, the maintenance of which will be a charge on the Committee's funds. These homes relieve the ordinary hospitals of men who have arrived at that stage of convalescence where very little medical treatment is required but whose condition is not such that they can return either to their units or to their homes. In a large recruiting centre like Johannesburg, invalided men are continually arriving, and one of the convalescent homes has therefore been established here and is running very smoothly and efficiently. It is controlled by a Johannesburg Sub-Committee of the Voluntary Aid Committee and three members of your Executive Committee are members of that sub-committee."

Messina Changes.

We understand that Mr. A. B. Emery has been appointed general manager of the Messina Company's properties in the Northern Transvaal and is now residing at the Messina mine. Mr. J. M. Calderwood terminates his engagement as the company's consulting engineer at the end of January, and will thereafter occupy the position as a director on the local board, in Johannesburg. Mr. J. Allan Woodburn also terminates his engagement as mine manager at the end of the year.

* * * *

Messina Ore Reserves.

The new board of the Messina Company is to be congratulated on having so quickly put the finances of the company on a healthy basis, and the Chairman's speech at the annual meeting —fully reported in this issue—will be found to contain a very explicit statement of the position. We cordially welcome the announcement that the company contemplates exporting copper instead of concentrates, and the new smelter will be a useful and promising addition to the industrial activities of the Province. Perhaps the sound position of the mine as reflected in the ore reserves is not sufficiently emphasised in the Chairman's speech. From the annual report of the consulting engineer, Mr. J. M. Calderwood, we learn that these at June 30 last stood at 252,000 tons, as against 230,000 tons at June 30, 1913—an estimate confirmed by Mr. R. J. Frecheville. It is perhaps a pity that the directors in justice to themselves should have thought it necessary to give prominence to the misfortunes of a family lately connected with the company, which, in another sphere, has covered its name with glory.

* * * *

The Chartered Meeting.

The annual meeting of the Chartered Company was held in London last week, and seems, under Sir Starr Jameson's able guidance, to have passed off very successfully. The extracts cabled out deal mainly with question of high politics, but for reference to the economic side of affairs we shall have to await the full report of the Chairman's speech. Referring to the ownership of land, Sir Starr Jameson regretted the delay in having this point settled, as it disturbed people's minds, and might to some extent damage credit. Though the case was still sub judice, he might assure the shareholders they were not anxious as to what the judgment might be. The Chartered Company's financial position was sound. There were ample funds for development schemes, and the company's capital was considerably more than intact. The directors, he added, considered it extremely advisable in the near future that the two Administrations of Northern and Southern Rhodesia should be combined. Rhodesian people favoured the idea of a larger Rhodesia from a patriotic point of view. The cables are silent in regard to the Chairman's remarks on the mining and general business outlook.

* * * *

Native Labour Position and Prospects.

For the best and most authoritative account of the native labour position and prospects, we have usually to await the periodical meetings of the Chamber of Mines. At the meeting on Monday, the President, Mr. E. A. Wallers, made the following important statement on the subject. He said:—"One is usually able at this time of the year to point to some improvement in the numbers employed. On this occasion, however, we are not in that position, though I think we are really very fortunate in that the numbers employed have fallen only to the extent which I shall presently detail. At the last quarterly meeting I referred to the improvement in numbers that was shown as at the end of August last, and this steady increase was maintained and improved on till the end of October. During November, however, we lost over 4,600 boys, and, therefore, the number employed at the end of that month was 166,000, as compared with 168,800 employed on the gold mines at the end of last August. The recruiting results on the East Coast, south of latitude 22 degrees, have continued to show a steady improvement during the whole of the period that we are reviewing, and this has, therefore, helped in a measure to counterbalance the unusual decrease in natives coming forward from the other territories in which recruiting takes place. The putting down of the rebellion naturally dislocated the railway service to some extent, and the condition of affairs generally no doubt had some effect on the native mind. Now that the rebellion fortunately appears to be over, there should be greater numbers of natives from the territories within the Union coming forward for work. It is true that both on the East Coast and within the Union the prospects for native crops are extremely good, and this fact may, of course, later on have some effect on our labour position. However, as you know, a great many natives were released from other industrial undertakings that are not in our fortunate position in these times, and it may be confidently stated that the general prospect of the labour position in the near future for the gold mines and collieries is favourable.''

* * * *

Vogelstruis Estates.

Owing mainly to a falling off in the recovery value of the ore treated the Vogelstruis Estates and Gold Mines reports a set-back in its mining revenue for the year ended 30th June. The credit balance at mining account is only £17,181, against £25,250 for 1912-13. In the profit and loss account, however, only £7,342 is written off this time for depreciation, against £26,738 a twelvemonth ago. The result is that on the year's operations there is a surplus of £2,603 to be applied in reduction of the debit balance brought forward at profit and loss account, which is consequently reduced to £30,575. The re-entry of the company into the dividend-paying list is still, unfortunately, not in sight. When the renovation of the stamp mill, which has been in progress for some time, is completed, say next March, the installation of a tube mill will probably be decided upon. By this means the consulting engineer estimates that the extraction could be raised from the current rate of about 93 to 95 per cent. Meantime, developments in the mine have continued satisfactory, though not quite so productive as in 1912-13. The South Reef ore reserve now stands at 245,000 tons, averaging 5·99 dwts. over a stoping width of 36 ins., an increase of 37,443 tons on the year. No credit has been taken for the Main Reef, which should still yield a substantial payable return. Perhaps it may be assumed that the accounts for the twelve months ended June 30 were dispatched from South Africa in a hurry, for the London auditors, in their certificate, say: "We are informed that the South African accounts have been audited locally, and certificates as to the balance sheets of September 30, 1913, December 31, 1913, and March 31, 1914, have been produced to us, and the balance sheet June 30, 1914, bears evidence of having been submitted to the auditors, but is not certified in the usual way.". Both technically and financially the Vogelstruis Estates is managed so capably that the above omission would appear to be an oversight. For a small company a very large amount of information is contained in the report, and much of it is just of that kind that shareholders desire to possess. The area intact is given as 109 claims, showing that approximately three claims were exhausted, while over 150,000 tons of mill ore were extracted.

* * * *

Welgedacht Exploration.

The report of the Welgedacht Exploration Company, Ltd., for the year ended 30th June, 1914, submitted at the meeting on the 24th inst., states that the total coal sales amounted to 119,360 tons, realising, with sundry items of revenue incidental to this section, £33,672, or 5s: 7¾d. per ton, which, after deducting the cost of working and handling, amounting to £26,942, or 4s. 6¼d. per ton, shows a working profit of £6,730, or 1s. 1½d. per ton. The average output per month was 9,946 tons, as against an average of a working profit of £6,730, or 1s. 1½d. per ton. The average monthly output for the four months ended 31st October, 1914, amounted to 10,112 tons. The property and equipment account has been increased by £989 after writing off £70 for depreciation on purchases made during the year, and £137, an amount to be received for land expropriated by the Government for railway purposes.

TOPICS OF THE WEEK.

THE OUTLOOK.

It is usual at moments like this to pause and take stock of the position. At what is practically the close of five months of the war, the Empire and South Africa can survey the scene with profound satisfaction. The rebellion is at an end, and the outlook in Europe, according to latest reports, is of a most reassuring description. Naturally, the condition of the mining industry reflects these happy circumstances, and the latest and most authoritative testimony to that effect, from the speech of the President of the Chamber of Mines on Monday may be put on record. "The industry," said Mr. Wallers, "in its almost unique position of good fortune, has been able to continue its ordinary operations without interruption, and, indeed, practically without any serious inconvenience. Since our last quarterly meeting we have, unfortunately, seen a state of rebellion in this country, but happily that has been put down with great promptitude. We are indeed fortunate in having General Botha and General Smuts and their colleagues to direct the affairs of this country. The task they have recently had to face has been one of extraordinary difficulty, and their attitude fills us with the keenest admiration.'' Moreover, it is good to know that things are no less satisfactory at the heart of the Empire. In mail week, the Chancellor of the Exchequer told the House of Commons that the great British War Loan for £350,000,000 had been over-subscribed. The successful flotation of this huge loan will not only gratify the pride of the nation in its own enormous resources, but will notify the rest of the world of our power and of our determination to bring the biggest war the world has ever seen to the only conclusion satisfactory to the Empire and to our Allies. The remarkable response which has been made to the appeal of the Government for this tremendous sum is seen at once when we compare the number of applicants for the present loan with that for the loan issued during the Boer war. In the case of the latter some 25,000 persons came forward and offered to assist their country by means of money, while we are now told that nearly 100,000 have applied for a portion of the £350,000,000 recently issued. And a large number of these patriotic people are small applicants, who for their readiness to help will receive the "first cut." This result will be regarded throughout the Empire with extreme satisfaction, for it is the finest example in our history of the stability of British credit. Mr. Lloyd George said we had just come through the most serious financial crisis the Empire had ever known, and he paid a tribute to the Stock Exchange when he recognised the great part that institution plays in the system of floating loans." He frankly admitted that if the Stock Exchange had been open there is not the slightest doubt the War Loan would have been subscribed many times over. Nevertheless, we are glad to note that not a single critic cavils at the splendid result which has undoubtedly been achieved, and especially when it is remembered that ninety millions had already been raised for the same purpose, making in all the unprecedented total of £440,000,000. Moreover, the contrast between the easy manner in which our loan has been found, and the various expedients which Germany has had to resort to replenish her purse, is particularly noticeable, and at the same time prophetic. Attention was also drawn by the Chancellor of the Exchequer to the strong position of the British money market, which at the present time is in a better condition than any other market in the world. On the first day the Bank of England re-opened after the war started, its bullion was twenty-six millions, but although they had not suspended the Bank Act, nor gold payments, the gold stored away by the Old Lady of Threadneedle Street at this moment amounted to 85½ millions. Further, trade throughout the Empire is improving, unemployment is going down, and confidence has most certainly been restored. South Africa, equally with the rest of the Empire, promises soon to reap the benefit of the improvement.

LORD HARRIS ON "GOLD FIELDS" MINING INTERESTS.

To the details of "Gold Fields" finances, as set out in our last issue, Lord Harris did not add much in his speech at the recent annual meeting, though shareholders doubtless appreciated his frank handling of the facts. The stagnation in the sharemarket in the year ended June 30, he admitted, had reduced profits from stock operations from £300,000 in the previous year to £20,000 in the twelve months under review, showing how "important a factor the sharemarket is in our business." Some of the remarks from the Chair under the head of depreciation were illuminating. "We do not think it desirable," said Lord Harris, "to specify the various items we have selected to write down; but I may say the amount I have referred to has been applied to such of our assets as we think have been most affected by the present condition of affairs. Lord Harris went on to state that "there is legislation contemplated in South Africa which will inevitably lead to increased expenditure in mining," which would point to the fact that London is forewarned in this direction. Despite all the unfavourable factors of to-day which Lord Harris did not attempt to minimise, he was able cheerfully to state that "on a most conservative estimate our liquid position is ample for all our requirements and none of the business which we actually had in hand at the outbreak of war will be handicapped for want of capital." This is most welcome information, chiefly for Rhodesia. The references to the mining interests of the "Gold Fields" in that territory were of unusual interest and conveyed information new to us here. "I am happy to say," said Lord Harris, "that the Falcon Company anticipate no difficulty in marketing their output. They were in great perplexity a very few days ago, for, although the mine was producing quantities of blister copper, which contains a large percentage of gold, they were very doubtful whether, owing to the war, they would be able to dispose of it. I am very happy to say that within the last few days they have found that there will be no difficulty. Other satisfactory features are the fact that the five Rhodesian mines which are mentioned in our report have commenced crushing, and that the mine assay values are fully upheld by the actual results. This is particularly satisfactory both to our engineers and to ourselves, because their forecasts are borne out, and the confidence which we displayed in them when their reliability was assailed is fully justified." In regard to Rhodesia he added:—"I am happy to point out that early in 1915 it is anticipated that the Shamva will begin to set an example to our other Rhodesian companies by distributing a dividend. The Consolidated Gold Fields itself is, of course, only indirectly affected, Gold Fields Rhodesian Development being the shareholder; but, of course, through Gold Fields Rhodesian, and through that company's financial position being assisted as mining companies pay off their debts, the Gold Fields will get the advantage." Summing up the general prospects, Lord Harris said:—"For how long this depreciation may continue, for how long trade will be dislocated, for how long the obtaining of capital for new enterprises will be impracticable it is useless to speculate, it is all wrapped up in the great question we all ask ourselves so often, For how long will this war last?" Other questions were raised at the meeting of what may be termed a domestic nature, such as directors' fees, contributions to war funds, and method of presenting general charges. The critics who brought up these matters were effectively silenced by Lord Harris, and the points we have noted seem the only ones of any interest on this side, not already fully covered in the annual reports recently printed in our columns. In reply to one critic, however, it is noteworthy that Lord Harris remarked that they were criticised for deserting South Africa for other parts of the world. In good times, he explained, they had gone into one or two mining ventures in South Africa outside their original investments, but they had not come to fruition, because, with the withdrawal of Chinese labourers, labour had failed. Some of their companies had done very well Robinson Deep, Simmer and Jack, and Knights Deep—while Sub Nigel was coming along now. But the Jupiter, Simmer East, and the Simmer Deep had been a great disappointment, and he submitted that very few of the present directors had anything to do with the taking up of the original claims. Mining men, at any rate, will acquit the directors of any blame for the misfortunes of the three properties in question, and it is to be hoped that the remarks of Lord Harris do not portend any slackening or abandonment of the effort now not unsuccessfully being made to put the Simmer Deep on a firm basis. And it is only fair to add that if the far-flung interests and undertakings of the "Gold Fields" in other parts of the world are anything like as well managed as those on the Rand—which have long been conspicuous for their sound and enterprising handling—the dawn of peace and restoration of normal monetary conditions should see the "Gold Fields" shareholders amply recompensed for the deferred hopes and dividends of to-day.

THE TRADE COMMISSIONER'S REPORT.

Sir Sothern Holland's report on trade in this country, though dealing with 1913, throws a flood of light on the business questions raised by the war. Not the least valuable feature of the report is the mass of tables which is included to illustrate the shares of the different competing countries in our trade. We hope to print several extracts from the report, and will here briefly note some points bearing on the burning topic of the moment, the German share of our trade. Sir Sothern Holland shows that the percentages respectively of British and foreign (mainly German) participation in the imports of electrical, mining and other machinery and plant in 1912 and 1913 were as follows:—

Percentage of total imports from –

	United Kingdom.		Foreign countries.	
Class of goods.	1912.	1913.	1912.	1913.
Mining	60·65	59·22	39·34	40·73
Electrical ..	50·19	48·49	49·80	51·50
General machinery	60·02	58·70	39·00	40·20

The increase in the percentage of foreign imports is certainly a timely warning to British manufacturers. It is recalled that when British and German tenders were opened last year for 10 locomotives and 34 coaches, it was found that by ordering them from German firms the outlay would be £110,000 less than if they were placed in the United Kingdom. Sir Sothern Holland points the moral that: "The feelings and policy of the Administration make it clear that British manufacturers are now faced with a new position in regard to railway business in the South African market. There is no doubt that our competitors, with the opportunities now given them, will cut their prices as low as possible in order to secure a foothold." He goes on to say that the upward tendency in prices in the United Kingdom during recent years is accountable for many complaints and considerable loss of business, due to foreign firms apparently not finding it necessary to increase their prices to anything like the same extent. Another grievance against the British manufacturer is on the score of late delivery; and the South African buying departments threaten that penalties for delay will be strictly enforced. It is not an uncommon practice for the Government to accept a tender at a higher price because quicker delivery is offered. If the successful tenderer exceeds the contract period, the Department not only pays the higher price and loses the advantage of early delivery, which is purchased, but is inflicting a hardship on the lower and perhaps more conscientious tenderers. The two weak points in Great Britain's competitive trade are thus brought together, viz., high prices and late deliveries; and confirmation of this is forthcoming from non-official as well as official sources. To relieve the picture, he quotes the following opinion of "one of the most prominent electrical engineers of the Witwatersrand"—a man of great experience with plants of all competing countries. "At the present time," said the latter, "we have one or two firms in England who can hold their own with any of the Continental houses, and since we have agreed that quality, and not price, shall be our first consideration in placing orders, we have not had nearly so much trouble." It is to be hoped that the advantage which will accrue to the British manufacturer through the war will be made permanent.

THE GREAT COPPER MINES OF GERMAN SOUTH-WEST AFRICA

Their History, Owners, and Transport Problems—Products Exported to Germany and the U.S.A.

GERMAN South-West Africa, we may remind our readers, is bounded on the north by the Cunene River, which enters the Atlantic near the 17th deg. south latitude, on the south by the Orange River and Cape Colony, on the east by British Bechuanaland and Rhodesia, the western boundary having a length of about 1,000 miles of seaboard on the South Atlantic. The total area is, approximately, 322,450 English square miles. For more than a generation the copper deposits in the Otavi district have been known to South Africans, and were habitually worked on the surface by the native Ovambos, who owed to them their remarkable profusion of heavy copper ornaments. It may be said that these deposits were the principal objective of the gentlemen who originally secured the Damaraland Concession. This district, therefore, has come in for the lion's share of the attention of the company's explorers. The company's first expedition, despatched in 1892, under Mr. Matthew Rogers, in addition to development work on the already known copper deposits, discovered the splendid Tsumeb outcrop. Nevertheless, the distance from the coast was felt to be an impediment for immediately starting work on a commercial scale, as this entailed the building of a railway about 350 miles in length through what was at that time a very imperfectly known country; and consequently, although surveys were made, the actual railway construction was postponed until further and much more extensive development work had been done. This was accomplished by an expedition which was sent out in 1900, under the late Mr. Christopher James, the company having first disposed of its mining rights in the Otavi region over an area of 1,000 square miles to a German company (the Otavi Minen und Eisenbahn-Gesellschaft) with £1,000,000 paid-up working capital, which it had formed conjointly with some of the leading banking institutes of Germany. A sum of no less than £70,000 was expended in further proving the Tsumeb mine and making the necessary surveys for the railway. The outcrop at Tsumeb is described by Mr. James as being "550 feet wide, and from 30 to 40 feet high, consisting of two distinct bodies of ore separated by a hard, compact sandstone, and forming a small hill at the foot of a large limestone kopje. The mixture of ores constituting the outcrop is wonderful. Galena, copper glance, and carbonates of both metals can all be found in one piece of rock. To the north the limestone shows small stringers of carbonate of copper, which, in depth, proved to be copper glance." There is a plentiful supply of water within a convenient distance from the mine. Native labour is abundant, the native being unspoiled, and anxious to earn money. The climate is healthy, and fever very rare. The net result of Mr. James's working was to prove at the two levels nearly 300,000 tons of high-grade ore, yielding about 36,000 tons of metallic copper and about 69,000 tons of metallic lead, the total value of which, taking copper at £60 and lead at £12, worked out at upwards of £3,000,000. The total cost of placing this metal upon the European market was carefully and conservatively worked out in detail at £1,180,000. The South-West Africa Company has a capital of £1,250,000 issued and fully-paid out of a nominal capital of £2,000,000. The company's chief asset is its shareholding in the Otavi Mines and Railway Company. As already briefly stated, this concern was formed some years ago by a number of leading financial groups, among whom were the Direction Disconto Gesellschaft, the Deutsche Bank, Messrs. S. Bleichroder, Messrs. Wernher, Beit and Co., and Messrs. A. Goerz and Co., Ltd. It has an issued capital, which has been fully paid up in cash, of £1,000,000 in 200,000 £5 shares, of which the South-West Africa Company owns 80,200; while there are also 200,000 deferred shares, of which the South-West Africa Company owns 140,100. The deferred shares participate in the profits equally with the ordinary shares in each year after a dividend of 5 per cent. has been paid on the latter. By virtue of this shareholding the South-West Africa Company holds an interest in the Otavi company of about 55 per cent. The Otavi company took over from the South-West Africa Company (out of the assets cited above) 1,000 square miles of mining rights and 500 square miles of freehold rights contained therein, the object being to work the well-known Otavi group of copper mines situated in this area. The Otavi company had also the right to connect its territory by railway with the coast, and received large freehold and mining rights along the track of this railway. The latter was completed in 1908. The ore mined is divided into (1) a high grade copper product—principally copper glance—which is bagged for export to the U.S.A. through Swakopmund, (2) lead ores, largely galena, and low grade carbonate copper ores which are smelted at the mine. The products of the smelter are pig lead and a copper-lead-iron matte, both of which are exported to Germany for further treatment. Export is now, of course, stopped, and nothing is known of the position at the mine.

U.S.A. Metal-Mining Accidents.

"It is gratifying to note that the fatality rate in the metal mines of the United States was lower in 1913 than 1912," says Albert H. Fay, engineer of the Bureau of Mines, in a technical paper just issued. The total number killed in the metal mines in 1913 was slightly greater than in 1912, but the number of men employed during 1913 was 193,088, as compared with 169,199 for 1912. The fatality rate was therefore 3·54 per 1,000 men employed as against 3·91 per 1,000 for the year 1912 and 4·19 for 1911. The important mining states showing a continuous reduction of fatality rates during 1911, 1912 and 1913 are Idaho, Michigan, Montana, Nevada, New Jersey, South Dakota and Utah, representing in 1913, 38 per cent. of the mining industry. Of the states showing a decreased fatality rate during 1913, as compared with 1912 only, may be mentioned Alaska, Alabama, Colorado, New York, Oklahoma, Tennessee, Wisconsin and Wyoming. "This gradual reduction is to be accounted for largely by the introduction of safety appliances, better supervision and a more strict enforcement of rules and regulations of the mining companies, and a closer observance of the state laws. Practically all of the larger companies and many of the smaller ones, have done much in safeguarding their employees. By first-aid treatment many slight injuries have been cared for, pain relieved, and a cure effected in a short time, so that many of these injuries have been of short duration and kept out of the 'serious injury' or 'fatality' class." The number of men employed and the number of men killed in and about the metal mines in the United States during 1911, 1912 and 1913 is shown in the accompanying table.

Year.	Number Employed.	Total Killed.	No. Killed per 1,000 Employed.
1911	165,979	695	4·19
1912	169,199	661	3·91
1913	193,088	683	3·54
Average for three years	176,089	680	3·86

Glynn's Lydenburg.

The following are the particulars of this company's output for the month of November, 1914:—Tons crushed, 3,963, yielding 1,644 fine ozs.; estimated value of month's output, £6,891; estimated profit for the month, £3,053.

MINE SIGNALLING SYSTEMS AND "SAFETY FIRST."*

A Valuable Practical Suggestion for Minimising Accidents.

[By J. J. Kinleyside.]

Whilst upon the question of mine signalling systems raised by the valuable and interesting paper contributed by Mr. Gould, I should like to bring before your notice and consideration a certain aspect relative to the subject in which I have been interesting myself recently. My special objective is directed towards ensuring the safety of a skipman or any other authorised persons who use the locked bell system of signalling when travelling up and down shafts in skip or cage. I may say with pleasure that I was prompted to interest myself in this subject by a question put to me by an engine driver, Mr. Bottom, of the Durban Roodepoort Gold Mining Company. He called my attention to the desirability of being able to give signals direct from the skip or cage to the engine driver's platform, pointing out the ever-present feeling of uncertainty on the part of a driver as to everything being safe before the skip is moved. Considering the idea a valuable one, I designed the apparatus which I have here with me to-night, and which I call the automatic safety lock bell. The need for an arrangement whereby signalling can be done when in the skip has been accentuated since the 1912 Mining Regulations were adopted. These regulations make it compulsory that signals for persons riding shall be given upon the locked bell system. Prior to that valuable regulation being promulgated, when all bells were open, I have known careful and thoughtful skipman attach a piece of cord to the bell pull so that they could signal when in the skip rather than run any risk to themselves, which is involved by getting into the skip or cage after the final signal is given. Such a wise precaution cannot now be adopted with the locked bell system, for the skipman must remain on the station and lock the bell or box after he has given the signal and before he can get into the skip. It is necessary that this should be emphasized, for therein lies the danger to the skipman. The definite action of locking the bell and climbing into the skip must be performed after the signal to move the skip has been given. The Mining Regulations state that a driver must wait at least ten seconds after receiving the signal before the skip is moved. This clause evidently contemplates that a skipman must of necessity perform some action or movement before it is safe that the skip could move. Engine drivers, being human, are liable to make the mistake of not waiting the stipulated ten seconds. The driver of a hauling engine has not the same advantage that the driver of a locomotive or motor car has. The latter has personal and ocular vision to assure him that the passengers are all aboard, whereas the hauling engine driver has to depend upon a mental calculation of time alone to guide him. I am told that some engine drivers resort to a variety of methods in order to insure the passing of ten seconds of time. Some will mentally count a number, whilst others will repeat signals. Such procedure shows the unsatisfactory uncertainty that must and does cause anxiety to the driver. Then again I know from experience the anxious apprehension in the mind of a skipman after he has given the final signal to raise or lower, especially in incline shafts, where not infrequently the station platform or landing is very inconvenient for getting into the skip. I have often seen a skipman take a flying leap into the skip, being fearful lest it should move before he was safely inside. It is easily possible for a skip or cage to be moved before the skipman has had time to lock the bell box, remove his key, and get into the skip, which actions have to be performed after the signal to move has been given. Delay sometimes occurs through a key sticking in the lock. The possiblity of a miner with heavy nailed boots on slipping whilst getting from a wet landing on to the iron plates of a skip, is ever present. The lighting of a station is not always good. It will be admitted that a multiplicity of contingencies are ever present to endanger the life of a skipman getting into the skip after the final signal has been given, even though the driver waited the full ten seconds. It is quite easy for an engine driver to move a skip instantly. At busy shafts, where constantly at attention to signals, he could in a moment release the brake, and the skip would move instanter. Drivers, whose work requires them to hoist rock and persons alternately, are very liable to make the mistake of not waiting ten seconds. Therefore risk to the skipman will ever be present until some means are provided whereby he can signal when in the skip. The apparatus which I have designed consists of a wedge-shaped plug attached to a cord. The plug is inserted in a small iron box. This box contains two hinged rubbing contacts corresponding to the two contacts of the plug. The plug can be used in connection with existing bell pulls, or it may have added to it a double, flexible, insulated wire, one end of the wire being connected to the plug and the other to a suitable press button. The procedure is as follows: The skipman unlocks the metal box. He inserts the wedge-shaped plug, takes out his key, and gives his signals in the usual manner on the station. Before giving the final signal, raise or lower, he enters the skip. He then rings "one" or "two," raise or lower, either by means of the press button at end of the flexible wire, or by means of an ordinary mine bell pull, having a cord convenient to his hand. On giving the final signal "raise" or "lower," a jerk at the cord releases the plug and allows the box to lock itself automatically. Even though the piece of mechanism I submit to you for inspection and criticism is rough and unpolished as regards finish, I have the fullest confidence in it as embodying in a practical manner the method by which a reliable signal can be given in a cage or skip with safety. It has been tested by Government mining inspectors and in the presence of competent hauling engine drivers, and answered all requirements.

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*Read before the South African Institute of Electrical Engineers.

Backers of the Kaiser: Enemy Companies in the Pillory.

Our London contemporary, the *Financial News*, is carrying on a very thorough campaign against "Backers of the Kaiser." It gives what it calls: "Particulars of interests in British companies held by backers of the cowardly ruffian who ordered the atrocities of Louvain, Termonde, Rheims, and Alost. Actual names of German individuals and companies that have drawn dividends from British concerns and used them as part of the revenue of the Fatherland, to finance devilries which have cost thousands of British lives *and have also doubled your income tax.*"

In giving its list of enemy companies, it says:—Below is a list of the companies, all of them including large German interests, which have so far appeared under this heading. Business with these companies is not "trading with the enemy" in the strictly technical sense, since they are English-registered. But is must be borne in mind that dividends paid by them in the past to German holders have formed a part of the funds out of which Germany has armed herself to destroy the British Empire. That is the proper light in which to regard them. Patriotic people who deal with these concerns are not trading with the enemy, nor yet putting money in the enemy's pocket, *so long as the war lasts;* but at the end of the war these concerns will remit immense accumulated dividends (till then lodged with the Public Trustee under the new Act) to Germany—to the devastators of Belgium, the bomb-droppers and mine-layers, the people who tell us how they hate us. Many of the shareholders in these companies have no doubt taken an eager personal part in the atrocities, the blackmail, arson, theft, and child murder, which have made up the German programme. Is it not unpatriotic on our part to trade with companies whose shareholders are actuated by such passionate malice towards us, and who take part in these devilries?

(1) Tudor Accumulator Co.
(2) Schmidt's Superheating Co.
(3) Kalle & Co., Ltd., Manchester.
(4) Ferrum, Ltd.
(5) Albion Record Co., Ltd.
(6) Electrical Works (Miller), Ltd.
(7) British Railway Traffic and Electric Co., Ltd.
*Armorduct Manufacturing Co.
(8) C. Happach & Co.
(9) Calmon Asbestos and Rubber Works.
*Orenstein & Koppel (Arthur Koppel Amalgamated).
Formiate Products Co., Ltd.
(10 C. G. Röder, Ltd.
(11) Union Electric Co., Ltd.
*N.S.U. Motor Co., Ltd.
(12) A.E.G. Electric Co., Ltd.
(13) British Mannesmann Tube Co., Ltd
(14) Sterling Telephone and Electric.
(15) J. A. John, Ltd.
(16) Continental Insurance Co.
(17) Adnil Electric Co., Ltd.

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*These companies do not appear in the "Backers of the Kaiser" series, but the particulars are none the less interesting.

Gold Mines Investment.

The report of the Gold Mines Investment Company for the year ended November 30 shows a net profit of £20,488, which is carried forward. The directors express regret at being unable to declare a dividend, and state that reserve funds amounting to £271,845 have been utilised for the depreciation, which is considered permanent.

THE YEAR WITH THE FERREIRA DEEP.

Greater Efficiency—Increased Tonnages Mined and Milled—Reduced Yield—Further Reduction in Working Costs—Outcrop Mine Almost Exhausted—Satisfactory Ore Reserve Position—Earth Tremors and Packing—Consulting Engineer's Comprehensive Review.

THE net profits earned during the year ended September 30 by the Ferreira Deep was £650,553 18s., which together with £268,267 5s. brought forward from last year and an amount of £11 14s. 9d. in respect of dividends unclaimed for a period of five years, now forfeited in terms of the Articles of Association, make a total of £918,832 17s. 9d. This has been dealt with as follows:—Expended on equipment account, £5,124; Government tax on profits, £57,293; interim dividends Nos. 22 and 23, £490,000; South African income tax, £219; balance unappropriated and represented by cash and cash assets, less liabilities, £366,195.

The consulting engineer, Mr. Percy Cazalet, writes:—

The comparative results of the salient features for the last three years are given below: Tons mined: *1911/12, 663,081; 1912/13, 744,971; 1913/14, 751,103. Per cent. sorted: 1911/12, 15·7; 1912/13, 13·1; 1913/14, 11·0d. Tons milled: 1911/12, 559,800; 1912/13, 647.550; 1913/14, 668,530. Yield per ton milled: 1911/12, 39s. 11d.; 1912/13, 41s. 6d.; 1913/14, 37s. 0d. Cost per ton milled: 1911/12, 21s. 3d.; 1912/13, 20s. 1d; 1913/14, 17s. 6d. Working profit per ton milled: 1911/12, 18s. 8d.; 1912/13, 21s. 5d.; 1913/14, 19s. 6d. Profit from current working, £521,561; 1912/13, £694,553; 1913/14, £650,702. Profit from treatment of accumulations: 1911/12, £10.429; 1912/13, £4,661; 1913/14, £2,399. Total working profit: 1911/12, £531,990; 1912/13, £699,214; 1913/14, £653,101. *1911/12 results cover nine months only of the amalgamated company and three months of the Ferreira Deep alone. The tonnages mined and milled during the year show fair increases, but these were only attained through its proving possible to hoist some 63,000 more tons through the two Deep shafts than during 1912/13, the previous best year, as the output from the Outcrop mine fell off considerably and may be expected to practically cease within the next few months. Some "Deep" ore is still hoisted, however, through the Outcrop shaft.

YIELD, COSTS AND PROFITS.

The drop in the yield is due to the increasing quantity of lower grade South Reef now being worked at the eastern end of the Deep mine and to the mining of Main Reef near the western boundary contemporaneously with the drawing of the Leader packs left for the support of the hanging while the stopes were advanced. These two areas are the main sources whence any increase of ore in the Deep mine must come to make up, as far as possible, for the shortfall from the Outcrop section. The costs have shown a further satisfactory drop of 2s. 7d. per ton following on one of 1s. 2d. in the year previous, or 3s. 9d. in two years. They have only been bettered once in the history of the mine, in 1909, the year immediately preceding the first trouble with the shafts, when costs reached the low figure of 16s. 2d. per ton. It must be borne in mind, however, that shaft maintenance and stope support now cost 1s. 6d. per ton milled, as compared with an almost negligible figure previously, owing to the present heavy nature of this section of the Central Rand. The profit from accumulations will not be large in the future, since these are now very limited in quantity. The Deep plant has been kept supplied at its maximum economic crushing capacity throughout the year, the balance of ore available from the Deep shafts, amounting to an average of over 9,800 tons per month, being transported on surface to the Outcrop battery.

EARTH TREMORS AND PACKING.

In addition to the ore returned as mined, 104,678 tons of ore were broken and packed in the current stopes as support for the hanging, while 55,803 tons of the total returned as mined were withdrawn from packs in stopes which could be safely abandoned. Since the commencement of the application of this system of supporting the workings 250,966 tons of ore have been built into packs, and a total of 73,422 tons withdrawn therefrom, leaving a balance of approximately 177,500 tons of broken ore being used in the underground workings for their temporary support. The cost of breaking and packing this ore has been met entirely out of working costs. Very constant earth tremors continue to be felt in the mine and more especially during the last few months, accompanied by crush in both the Deep shafts, some of the drives and nearly all the stopes. Continuous and expert attention is required in the shafts to maintain them in a safe condition for handling both the employees and the large volume of ore passed through them. This, although accomplished with success and without accident during the year, has at times occasioned anxiety, is a heavy drain on the available labour supply in times of stringency, besides directly adding some sixpence to sevenpence per ton to the expenditure. In the case of the drives it is found necessary, in the areas where the crush is severest, to remove the drive pillars, as they are a source of danger with a tendency to burst out under pressure, and to replace them by timber and packs in various form. It is when the stopes are considered, however, that the great advance of the last three years or so, since the general introduction of the stope packing system, is shown. The "crush" during the last few months has been greater than ever previously felt in the mine, but no single instance of lost stope faces, frequently experienced in past years, has occurred, and the underground efficiency shows a satisfactory and steadily maintained increase in all directions. No further sands-filling has been undertaken during the year under review.

DEVELOPMENT.

The development work accomplished shows only a slight reduction in footage, but will tend further to decrease in the future, owing to development being well ahead and the remaining areas yet requiring opening up being small. It is estimated that within the next two years the bulk of the necessary development work will have been completed and practically the whole of the mine be developed. No. 2 shaft was completed to its final depth during the year, and it is probable that No. 1 shaft will not be sunk as a full-sized shaft below the point at which the 15th level ore can be controlled; the triangular piece of ground below the plane of the 15th level being dealt with by an auxiliary winch. The crosscut on the 12th level to exploit the area south of the Grahamstown dyke has advanced a total distance of 1,023 feet south-east from the plane of the Leader, and has since the end of the year intersected reef to the south east of this dyke. Although an agreement has been come to with the Village Deep to carry out some preliminary development here on Ferreira Deep account, they have not found it possible as yet to make a start with this work. Generally speaking, the development accomplished during the year has been of better value than could be anticipated, and this is especially so to the east of No. 1 (east) shaft on the Leader, where ore of good value has been exposed on the 12th, 13th and 14th levels below an area which previously had given very disappointing results; also to the west of No. 1 shaft, where South Reef of exceptionally good value has been exposed. Development in the No. 2 shaft area above the 12th level is now practically completed, and the exposures here have been regular and satisfactory. The ore reserves have been recalculated as at September 30th, 1914, and amount to the following:—Leader: Outcrop section, 29,200 tons, going 6·7 dwts. or 28s. 2d. per ton; Deep section, 1,041,600 tons, going 8·7 dwts. or 36s. 6d. per ton. South Reef: Deep section, 822,300 tons, going 8·3 dwts. or 34s. 10d. per ton; total, 1,893,100 tons, going 8·5 dwts. or 35s. 8d. per ton. The estimated stoping widths on which the reserves of the Deep section are based are 78 inches for Leader and 57 inches for South Reef, as compared with 77 inches and 57 inches respectively in 1913. Of the above reserves some 548,900 tons, with a value of 8·6 dwts., are temporarily unavailable for stoping, consisting of shaft and boundary pillars and a few small sections still isolated as the result of the sands-filling carried out several years ago. The bulk of the ground originally isolated by sand, however, is now available, the drives having been to a large extent reopened through the sand, thereby giving access to the blocks temporarily abandoned, and also permitting of the recovery of considerable drive and stope pillars in these areas, which are not, however, included amongst the reserves. The 177,500 tons of ore in the reef packs previously mentioned as used to support the hanging wall in the current stopes are also additional to the above reserves. There are further, it is calculated, some 600,000 tons of about 3·7 dwts. value of Main Reef showing in the footwall of the Leader stopes at the western end of the mine, much of which can be mined at a profit at a time when the Leader packs in these stopes come to be withdrawn. It is this ore which must be drawn on to make up the shrinkage in the supplies from the Outcrop section. The foregoing payable reserves show a reduction of 81,300 tons and ·2 dwt. value, as compared with the reserves of a year ago. The accumulations of low-grade ore on the Leader and South Reef amount to 368,780 tons of 2·9 dwts. value, some of which will certainly be mined at a small profit before the end of the life of the mine. Pumping costs should be materially reduced when the concentration of pumping operations to two main stations on the 2nd and 12th levels at No. 1 shaft comes into effect about the end of this year (1914).

LABOUR AND PROFITS

The drop in the native labour available for underground work reported last year, continued until January of this year; by June the figures had risen by some 650, since when they have, however, decreased again considerably; the lower numbers at present available certainly affected the profits during October last considerably, and will continue to do so until an increase to nearer the true requirements of the mine takes place. The exhaustion of the Outcrop mine must be expected to have an effect on the profits to be recovered during the coming year, but if the Deep shafts can continue an output equal to the last couple of years the set back in total profit to be earned should not be so serious. At the moment costs are higher, again due to the reduced scale of operations of the last two months following on the lesser labour supply, and a severe skip accident during September, whereby No. 1 shaft was put out of commission for some eight days; the "bend" where the shaft changes from vertical to incline being stripped of its timber and requiring practically to be rebuilt; it is now at work again very satisfactorily.

The manager, Mr. F. J. Trump, writes, *inter alia*:—

The practice of supporting the hanging wall in the stopes by means of packs built of broken reef has been continued, with the result that no stope faces have been lost during the year. The crush experienced in the western portion of the mine is, however, very great, and the bursting out of drive pillars is of frequent occurrence. 104,678 tons of reef were packed and 55.603 tons withdrawn from packs during the year. The adoption of drill skips for each important level and the improved state of the crushed portions of the Deep shafts have permitted the hoisting of 613.272 tons of rock from these shafts, as against 550,340 during the previous year. The tonnage hoisted through the Outcrop shaft fell from 194,631 to 137,831, but against this 117,649 tons of Deep rock was transported over the surface to the Outcrop battery. Tonnage hoisted through the Outcrop shaft must be expected to fall off rapidly in the future. The working costs per ton milled at 17s. 6d. show a decrease of 2s. 7d. per ton. The recovery value per ton dropped from 41s. 6d. to 37s. owing to the mining of larger quantities of the low-grade South Reef in the eastern section of the mine and of Main Reef which is being mined concurrently with the removal of Leader packs in the western section. Development operations for the year resulted in 10.125 feet against 10.394 feet for the previous year. Shaft sinking amounted to 287 feet. The sinking of No. 2 Deep shaft was completed during the year and the No. 1 Deep shaft, still in progress, has reached the plane of the 15th level. Development operations on the Leader on the 12th, 13th and 14th levels east of No. 1 shaft have disclosed the existence of a large area of payable reef in a district previously assumed, from indications in the upper levels, to be worthless. The crosscut on the 12th level to the claims south-east of the Grahamstown dyke has emerged into quartzite, and is now close to the calculated position of the South Reef. The large new pump station and sumps on the 12th level have been completed, and, as forecasted in last year's report, the concentration of pumping plant to this level should be completed by the end of 1914. Cost of pumping should be improved by the completion of this scheme. The average number of natives in the company's employ was 3,225 against 3,630 for the previous year, a decrease of 405 boys. The increased economy in the use of native labour and the improved efficiency attained is shown by the increase of 6,132 tons mined in spite of the decreased labour force.

OPENINGS FOR IMPERIAL AND SOUTH AFRICAN TRADE.

Important Lessons from Australia—How Similar Problems Are Being Tackled.

An Australian newspaper, just received, states that the views of the manufacturers of Victoria and New South Wales regarding the industrial position of the Commonwealth as a result of the war have been submitted to the Federal Royal Commission on Food Supplies and Trade and Industry through the Executive Council of the Chambers of Manufacturers. It contains much of interest to South Africa. "Although German industry in many channels of trade," says the executive, "has been brought to a high state of perfection by the application of science and technical training to the various commodities exported from that country to Australia, generally speaking there is very little of the multitudinous commodities 'made in Germany' that cannot even now be obtained either from the United Kingdom or America. German trade has already been fostered on the basis of low prices, and although an increasing business has been done by Australia of late years with Germany, only temporary inconvenience will be felt at a stoppage of these supplies, as most of the trade done by the various members of our chambers in raw materials can be almost immediately diverted to other sources of supply, provided increased prices are paid. On general principles, seeing that German imports into Australia have been fostered largely on the basis of low prices and special freights, the obvious thing to do in order to divert this trade into other channels by the development of new Australian industries, the enlargement of present ones, or help the trade of the mother country. France or Belgium is to place a Customs surcharge for some years upon goods made in and coming from Germany and Austria Hungary. Further suggestions that would generally tend to divert trade from the enemy are as follows: "(a) Giving substantial preference in any readjustment of the tariff to goods made within the Empire. (b) The initiation and completion of reciprocal trade relations with our white kinsmen in the sister Dominions of the King across the seas. (c) The procedure concerning German patents and trade marks followed in the Mother Country can be adopted here, as already suggested by your Commission. (d) Immediate assistance can be given by the Federal Government in the direction of an effective tariff, substantial bonuses, and by assistance in capital expenditure, or in order to further develop by private enterprise the consumption of wool in our own factories, and the establishment of smelting works for the treatment of our own mineral ores. (e) An education in national sentiment and patriotism that would make it difficult to sell any goods 'Made in Germany,' if any reasonable alternative sources of supply exist. (f It should be borne in mind that the establishment of any new industry in the Commonwealth, the products of which would displace trade now done with the enemy, would probably necessitate the importation of highly-trained technical Continental workers. (g) German shipping to be treated by the Commonwealth in connection with passenger and freight traffic on the lines existing with regard to foreign commerce in the United States, Japan and other countries. If these general principles were adopted by the Commonwealth Government, we believe that it would not be long before private enterprise throughout the Empire could effectively deal with German trade. It is probable that, unless some immediate steps are taken by the Commonwealth Parliament in the direction of preference in trade with the Empire and to our Allies, a considerable portion of the trade Germany is sure to lose will be filched by the United States of America." The "Sydney Morning Herald" for September 28th quotes a Melbourne telegram stating that a circular letter had been addressed by Mr. Deakin, the chairman of the Foodstuffs Commission, to the Chambers of Commerce, Agriculture, and Mines, to the Institutes of Engineers, and other bodies, as well as to the Public Works Departments of the Commonwealth and the States, asking, in view of the serious interference with trade and manufactures threatened by the war, and the reduction of employment it might entail, unless energetic steps were taken to meet the situation: 1. What are the things of major importance to our production, manufactures, or trade, that will be wholly or partly unobtainable from the usual sources of supply? 2. To what extent, and by what means can they be produced in Australia, during, at least, the stoppage or reduction of supplies from abroad? 3. Failing Australasia, which of such things are likely to be obtainable from the United Kingdom by either the enlargement of a production already existing there, or by special efforts being put forth for establishing industries previously confined to the countries of the enemy? 4. Failing the foregoing, the possibility of supply from: (a) Other British Dominions; (b) our allies; and (c) neutral countries. 5. Can substitutes obtainable outside the closed sources of supply be temporarily used with success in processes of manufacture, or as ingredients? 6. What things from markets now closed, such as food and clothing usually regarded as necessities, may be replaced by articles not generally so favoured, but equally effective in use, which could be obtainable in Australasia or elsewhere? 7. Would the cancellation of patent rights held by subjects of the enemy in Australasia assist to any large degree the production and supply by Australasia?

Imperial Institute.

The annual report of the Imperial Institute, just issued for 1913, contains an account of the work carried on by the Scientific and Technical Department during that year, including mineral surveys in the Southern Provinces, Nigeria; the State of Gwalior (Central India); Ceylon; and in the Territory of the Mozambique Company, Portuguese East Africa, a large number of mineral specimens collected in these countries having been examined and reported on. East Africa Protectorate: Three samples of graphite-bearing rock and one of dolomite were examined. Nyasaland: A specimen of coal from Portuguese East Africa was received from the Nyasaland Government. It was obtained from a deposit which is believed to extend into British Territory, and although it proved to be of rather low value as fuel, the occurrence is sufficiently promising to warrant full investigation. Minerals: Sixty-five enquiries regarding the occurrence, use, market values, etc., of various minerals were dealt with during the year. These included the occurrence of mineral pitch in the East Africa Protectorate; the occurrence and uses of uranium ore; the occurrence of copper ore in Newfoundland; information as to coal and tungsten in India, and the occurrence and uses of titanium ores.

Mr. F. D. P. Chaplin left for Rhodesia on Sunday. Speaking at the quarterly meeting of the Chamber of Mines on Monday, the President, Mr. E. A. Wallers, said:—"As you know, Mr. Drummond Chaplin has just recently left to take up the position of Administrator of Southern Rhodesia. It is some time since Mr. Chaplin was a member of this Executive, but his work on behalf of the industry has been, as you will realise, of very great value, and his departure is a real loss to this industry and the community generally. We wish to express our keen appreciation of his services to this Chamber, and to express the hope, also, that he will meet with every success and happiness in his new sphere."

Correspondence and Discussion.

Comments on Questions Arising in Technical Practice or Suggested by Articles in the Journal—Views, Suggestions and Experiences of Readers.

A Zinc Industry in S.A.

To the Editor, *South African Mining Journal.*

Sir,—In your issue of the 28th November on the title of "The Opportunity for South African Industries," and possibilities of zinc smelting, etc., you do not mention that about 6,000 tons of zinc are thrown away by the gold mines of the Rand every year. This zinc could be recovered economically by my first Rhotolyse process, description of which has been given in your 21st anniversary number, September, 1912.* The British company which has bought some interest in my patent has, as members of the advisory council, Sir William Ramsay, G. Leroux, Prof. Ecola-centrale, Paris, and some of the best known American scientists. On the observation of these gentlemen that my process could work only regularly by sunlight, and therefore in South Africa or sunny countries, and could not be used in Siberian gold mines or other cloudy countries, I found out that the same result could be obtained with special mercury-vapour electric lamp. These lamps are manufactured in such a way that they can work under water. By this improvement my process can work automatically day and night. It is on this improvement that the British company has taken new patent rights in the principal countries of the world. The plant is identically the same as that described in your number of September 14, 1912. The mercury-vapour electric lamps are hung in the solution tanks between each aluminium sheet. In ten minutes all the gold contained in the solution, in the form of salt, is precipitated in metallic form on the aluminium sheets and can be easily scraped. After the gold has been extracted and all foreign metal precipitated into the bottom of the tanks the precipitation of the zinc begins and lasts according to the temperature of the solution. The zinc is just the form required to be treated by the electrolysis process. The price of the zinc sheets on the Rand admits of the use of this process which is utilised near Petrograd in Russia for the last fifteen years on a large scale.—Yours, etc.,

G. JACQUIER.

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*Improvements in the photolyde process for the precipitation of gold, zinc and other metals from solution by ultra-violet rays. British complete patent granted to Prof. G. Jacquier in July 1914

The Electric Blasting Accident.

To the Editor, *South African Mining Journal.*

Sir,—The defunct J. Lawson mentioned at the accident at the City Deep, was (I am almost sure) a miner at Jagersfontein at the time (October, November, December, 1900) Jagersfontein was in a state of siege. Mines were set at certain strategic points, to be blasted on emergency by electricity. The insulated wire that should have been used for the connections was not then procurable. On four separate occasions, with my own eyes I saw four of these mines exploded. The flash most probably did not strike directly on the wires, but certainly may—or did—have set up some sympathetic current in the earth itself.. But the flash certainly caused the explosions. J. Lawson must have known this. On the other hand, he was at the bottom of a shaft, of which the depth is not recorded. In such weather as has been obtaining of late, those wires should not have been allowed to protrude at the surface. Either they should have been stationed some 20 to 30 feet from the surface, or the miner should have unwound them off a reel in the act of ascending—or failing these precautions, he should have been warned from the surface that thunder conditions existed. Lawson, with his experience, would never have been killed from a cause of which he well knew the danger. Yours, etc.,

A. J. K.

Voluntary Civilian Training Association.

To the Editor, *South African Mining Journal.*

Sir, I have been instructed to send you the following for public information:—The deputation appointed at the emergency meeting of the V.C.T.A. on the 7th instant met General Smuts on Saturday the 12th inst. at 11.30 a.m. The deputation consisted of Messrs. E. G. Clifford-Jones, R. Currie (Johannesburg), R. C. Perkins (East Rand), P. R. Cooke (Germiston), and the Secretary. Messrs. J. R. Addie (Witbank) and T. H. Bayldon (Roodepoort) were unable to attend. The Minister sympathetically received the deputation and stated that the Government highly appreciated the spirit of the movement and could assure the deputation that the Association had served a very useful purpose. On the question of the permanent establishment of the V.C.T.A. the Minister stated that he would appoint an officer immediately to investigate the whole organisation, and upon his report the Minister would go into the matter, and after consideration of this report he would communicate with the Committee of the V.C.T.A. The Minister further stated that some rifles and ammunition would be provided for the members of the V.C.T.A. for instructional purposes, and he would deal definitely with the question as soon as he had received the report from the officer to be appointed. An emergency meeting was held in the Board Room, Consolidated Building, Johannesburg, on Thursday, the 17th December, to receive the report of the deputation appointed to interview the Government on the permanent establishment of the V.C.T.A., and the following resolution was unanimously adopted: "This meeting, having heard the explanation of the deputation, resolved that the Association be continued until the receipt of the report from the officer to be appointed by the Government, when a further meeting will be called." Yours, etc.,

H. H. FISHER,
Johannesburg, 18th December, 1914. Secretary.

ANSWERS TO CORRESPONDENTS.

"Northumbrian."—Your letter is held over.

"Diamond Shareholder."—There is a Chamber of Mines at Luderitzbucht, but we have heard nothing of it lately. Doubtless it is being reorganised.

"Buyer."—We have asked the agents to communicate with you.

"Student."—Apply to the librarian of the Seymour Library, School of Mines Building.

"E. F. P."—The Crown Mines distribution in 1913 was the same as for the preceding year.

"Shareholder."—Certainly this is not the time to look for any announcement from the directors of the property in question; wait till the war is over.

The New Workmen's Compensation Law.

The new Workmen's Compensation Act for the Union comes into force on January 1, and the regulations were published in Friday's *Gazette*. In view of the extreme importance of the subject, the *Transvaal Leader* have arranged with Messrs. J. T. Barry, M.A., and G. E. Barry, M.A., to write a comprehensive and authoritative work on the subject. Both these gentlemen are highly qualified to undertake the task. Mr. G. E. Barry is the legal adviser to the Rand Mutual Assurance Co., and in that capacity is in daily contact with compensation questions.

MINING SUBSIDENCE.*

Some Points from Coal Mining Practice Bearing on a Problem of Growing Importance on the Rand.

[BY GEORGE KNOX, PRINCIPAL OF THE SOUTH WALES AND MONMOUTHSHIRE SCHOOL OF MINES, TREFOREST.]

THIS is a subject of considerable importance to geologists and mining engineers, and is one which directly or indirectly affects all owners or users of land in mining districts; yet, comparatively speaking, very little is known at present regarding the results likely to be effected under any given system of working. In some of the deeper mines in Great Britain, where the lower seams have been extracted in advance of the upper ones, it has been observed that the fractures in the upper seam caused by the strata subsiding into the mined area below, slope forward over the solid coal at varying angles depending on local conditions. In this short paper the writer does not pretend to put forward a theory to explain the relationship between "subsidence" and the "angle of pull" (or draw), but merely to record several observed phenomena and deductions made from them, which may form a basis for discussion of the subject. There are several points which may be considered sufficiently well established to form a basis for further investigations, *e.g.*:—(*a*) That surface subsidence invariably extends over a greater area than that excavated; (*b*) that the angle of pull is determined by the ratio between the excavated and subsided areas; (*c*) that this ratio is determined by a large number of factors, among which may be included the following:—(1) The amount of permanent support left in the mined area; (2) the thickness of the seam, etc., worked; (3) the depth of workings from the surface; (4) the method of working adopted; (5) the direction of working in relation to the jointing of the strata; (6) the rate at which the workings advance; (7) the nature of the strata overlying the workings; (8) the presence of faults, fissures, etc., in the strata; (9) the permeability of the overlying rocks; (10) the dip of the strata; (11) the surface contour; (12) the potential compressive forces existing in the strata containing the workings.

It is evident that the number of factors which govern the relationship between subsidence and the angle of pull make it exceedingly difficult to find exactly similar conditions, from which similar results might be expected. Where the physical or geological conditions are identical, the method of working, packing, etc., may be different, and *vice versa*. This is very apparent in mining engineering, where formulæ devised by mining engineers to find the size of shaft pillars (probably obtained from actual experience in some particular district) are so varied in their results as to be useless as a guide to others. Examples could be quoted to show that, owing to the influence of dip on the angle of pull, pillars of support have often been left in the wrong place. To obtain brevity of expression in referring to the phenomena associated with subsidence, and to prevent misconceptions regarding the meaning of the terms used, the writer has adopted the terms defined by Mr. H. W. G. Halbaum in his paper, "The Great Planes of Strain in the Absolute Roof of Mines,"† as follows:—*Mined Strata.*—The sub-cylindrical column of strata, the perimeter of which is the excavation proper. *Dead Zone.*—The portion of mined strata which has settled through the maximum subsidence. *Motive Zone.*—The portion of mined strata still in process of sinking. *Littoral Zone.*—The distributed strata immediately in advance of the mined strata. *Prime Strata.*—The strata immediately in advance of the "littoral zone." *Absolute Roof.*—The entire body of overlying strata. *Nether Roof.*—The short depth of roof immediately above the workings that timber might be expected to support. *Vertical Face.*—The vertical plane of the line of working face in longwall, or the goaf line in bord and pillar workings. *Prime Face.*—The conterminous face of the littoral zone and prime strata. *Stress.*—The intensity of the force. *Strain.*—Any alteration of figure produced by the application of force. *Draw.*—The horizontal measurement of the littoral zone (at the surface). *Subsidence.*—The vertical measurement of the displacement of the motive zone. *Angle of Pull.*—The angle between the vertical and prime faces.

When excavations are made at the surface the walls of the trench, even in comparatively hard strata, always tend to move towards the centre of the excavation, due to the liberation of potential forces stored up in the earth's crust through secular cooling. If the strata is soft a greater movement will be effected, the strata moving into the excavated area until the "angle of repose" is reached. When an excavation is made underground by the removal of a layer of coal or other rock, two potential forces are liberated. One of these, due to gravity, is acting vertically downwards at an approximate pressure of 1 lb. per sq. inch per foot in depth; the other is acting horizontally, and is projected against the former in a direction opposite to that of the workings forming the excavation. It has been frequently noted that where the vertical force is allowed to act rapidly, the strata forming the nether roof break through in the form of small slip faults, with a maximum amount of subsidence and the angle of pull only a few degrees from the vertical. If, on the other hand, the vertical mass subsides slowly, without fracturing the nether roof, the angle of pull is increased and the subsidence reduced. As the two forces referred to are acting towards the excavated area, forming planes of strain sloping forward over the solid face of the workings, it is evident that the ratio of vertical to horizontal movement produced determines the angle of pull. If the subsidence is a maximum, the angle of pull will be a minimum and *vice versa*, because the greater the subsiding surface for a given area of excavation, the less subsidence must there be. The numerous causes which determine subsidence and angle of pull account for the very varied results noted by observers in different mining districts. Mr. J. S. Dixon* gives examples where the draw varied from one-eighth to two-thirds of the depth of the seam from the surface, which equals 7⅛ deg. to 33⅔ deg. angle of pull. Mr. J. P. Kirkup† noted that the relative draw was one-quarter to one-third of the depth, which equals 14 deg. to 18½ deg. angle of pull. Mr. J. Piggford‡ gives 16 deg. as the angle of pull. Mr. W. Hay gives the draw at Shirebrook Colliery at 240 to 300 ft. at a depth of about 1,700 ft., which is one-seventh to three-seventeenths of the depth and equals 8 deg. to 10 deg. Mr. H. T. Foster§ gives the angle of pull at 34½ deg. in a seam dipping 5½ deg. with the workings on the strike. The reason for the difference in the results quoted may be partly explained by taking the factors 1 to 12 previously enumerated as determining the angle of pull in the order given.

(1) *The Amount of Permanent Support Left in the Mined Area.*—This has considerable effect in determining the amount of subsidence and angle of pull as shown in coal-mining areas, particularly where the angle of pull is practically proportional to the efficiency of the packing put into the excavated area. In horizontal seams where the coal is extracted by the longwall process of working, the angle of pull may be as low as 8 deg. (from the vertical), whereas if efficient hand packing is adopted the angle of pull may be increased to over 30 deg. According to Dr. Neiss, when packs were made with small-grained pit rubbish the roof subsided 25 per cent. of the thickness of the seam; when made with pure sand about 8 per cent.; and with sand flooded in a semi-fluid state (hydraulic packing) complete immunity from subsidence may be obtained. Herr Buntzel, giving particulars of fourteen instances of packing old workings with sand, clay, ashes, etc., in a semi-fluid state, says that the subsidence is comparatively small in degree, varying from 0.3 per cent. to 7.8 per cent. of the height of the seam (as compared with 30 per cent. to 70 per cent. where the roof was allowed to fall in). What subsidence did take place occurred without fracturing the strata, and the angle of pull was greatly increased. It is evident that the greater the percentage of *débris* put into the mined area the less movement can take place in the absolute roof, thus keeping the latter whole and "drawing" for longer distances over the solid workings. In many of the examples of subsidence recorded it has been noted that when the strata in the absolute roof become fractured these fractures increase in width as the workings advance towards them, reaching the maximum (2 in. to 3 in. in some cases) when the working faces are immediately below, and closing up again as the workings advance beyond them. The nearer to the vertical these fractures take place the wider they become, doing a considerable amount of damage to surface property. As the angle of draw increases the fractures decrease in width and subsidence takes place so slowly that even though large buildings become slightly tilted on the approach of the workings, they will right themselves again without serious fracture when the workings have passed beyond them.

(2) *The Thickness of the Seam Worked.*—In thick seams, even if as efficiently packed as thin seams (which is seldom the case, owing to the difficulty of providing sufficient packing material), the total subsidence is increased and the angle of pull is small. As the workings advance slowly and usually irregularly (owing to the method of working adopted) the tendency to fracture the absolute roof is great. The fractures produced are usually very wide, and, the prime face being nearly vertical, this allows the force in the motive zone to exert itself rapidly and often in a jerky fashion, suddenly breaking off pieces of the nether roof. This is probably why the accident rate is usually two or three times as high in thick seams as it is in thin seams.

(3) *The Depth of Workings from the Surface.*—In shallow workings subsidence usually takes place suddenly, the subsiding surface being very little larger than the excavated area, owing to the angle of pull being small. Even if the prime face remained at the same angle, it is evident that, as the depth increases, the subsiding area at the surface increases for the same area of excavation. The angle of pull is likely to increase with increased depth, owing to the draw of the littoral zone against the motive zone assisting to support the absolute roof and allowing it to sink gradually in a slightly curved form without fractures.

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* Paper submitted to the International Geological Congress, Canada.

† Transactions Institution of Mining Engineers, 1906, Vol. XXX., p. 176.

* Trans. Min. Inst. Scotland, 1885, Vol. VII., p. 221.

† Trans. Inst. Min. Eng., 1904, Vol. XXVIII., p. 320.

‡ Trans. Inst. Min. Eng., Vol. XXXVIII., p. 129.

Trans. Inst. Min. Eng., Vol. XXXVI., p. 427.

§ Trans. Inst. Min. Eng., Vol. XXXIV., p. 407.

(4) *Method of Working Adopted.*—In longwall workings, where the coal is completely extracted in one operation, subsidence (varying according to depth from the surface, thickness of seam, efficiency of packing, etc.) usually takes place along planes parallel to the working faces, but some distance in advance of them. In bord-and-pillar workings, where the lines of faces on the pillars being extracted may be very irregular, and where the roof is usually allowed to fall in as the pillars are taken out, the subsidence is increased and irregular in form. If, however, subsidence does take place along planes parallel to the jointing of the rocks, a large amount of the coal in the pillars is lost through excessive crush. If the pillars are made too small the weight of the absolute roof crushes them into the floor, forming incipient fractures which may pass for long distances up through the strata. Any movement of this description increases the subsidence when the pillars are being extracted.

(5) *Direction of Working.*—This will also have a distinct bearing on the relationship between draw and subsidence, particularly in districts where the strata are widely jointed. If work is prosecuted parallel to the "cleat," or jointing, subsidence will be greater than when it is carried on at an angle across the joint planes, because fissures will be more readily produced in the former case.

(6) *Rate at which Workings Advance.* Where workings advance rapidly the tendency will be for the strata to bend without fracturing: whereas if the opposite is the case, the force of the motive zone has time to break through, as is frequently shown on the working faces after a prolonged stoppage due to holidays or strikes.

(7) *Nature of Overlying Strata.*- As the angle of pull under normal circumstances might be expected to approximate to the angle of repose for any particular series of rocks, the softer the beds the greater the angle of pull that should result. In mining this is not usually the case where the overlying strata consist of very thick hard layers of sandstone: the angle of pull is invariably larger than where the strata are soft. This may be due to the rapidity of the action of subsidence in soft rocks and to lack of cohesion between the rock particles permitting sudden changes of strain to take place by fracturing. Thick sandstone layers will bend for considerable distances without breaking, pulling over the solid coal for great distances, and often pulverising the coal by excessive crush.

(8) *Presence of Faults and Fissures.*—In the presence of faults the subsidence of strata tend to draw into the hade of the fault, which, if flat, greatly increases the angle of pull. The result of the great pressure thus produced on coal seams in the vicinity of faults is shown by the number of spontaneous gob fires which have taken place under such conditions in seams liable to spontaneous combustion. It has also been frequently noted that when working under the usually badly fissured Magnesian limestone in Yorkshire, Northumberland and Durham districts, the angle of pull is very frequently increased when approaching the limestone.

(9) *Permeability of the Strata.* -Strata heavily charged with water will no doubt move more rapidly than dry strata, on account of the lubrication afforded by the water. Some engineers, on the other hand, have suggested that the draining of wet ground by underground mining operations tends to increase the subsidence, which would as a result reduce the draw.

(10) *Dip of Strata.*—The angle of inclination of the strata plays a very important part in determining the ratio between subsidence and draw. In flat workings the weight of the vertical strata composing the absolute roof will by force of gravity tend to force the under roof into the excavation, producing maximum subsidence with minimum draw. In vertical workings the maximum movement will be in the direction of draw, as the strata on either side of the excavation are still supported by the strata immediately beneath; hence the "caving" in of the walls will be the result of horizontal pressure, assisted by the beds assuming the angle of repose. In degrees of dip varying between the horizontal and vertical the subsiding or "drawing" movements will be largely determined by the dip, as the amount of support afforded to the absolute roof by the solid strata underneath will affect the gravity pull, which decreases as the dip increases. Here again the practice of leaving pillars in coal mines to support surface property, on the assumption—which is frequently made—that at all dips over 24 deg. the angle of pull is vertical, has resulted in considerable damage. Even at a dip of 24 deg. it is hardly possible to imagine mined strata coming to rest on the prime face. It is less likely that the prime face will be vertical where the dip is greater than this. It appears to the writer that in excavations made in fairly hard rocks the tendency would be for the angle of pull to increase regularly from the horizontal position to the vertical, where almost the whole of the disturbance results in draw.

(11) *Surface Contour.*—It is a well-known fact that, where the surface is irregular, the greatest disturbance on the surface resulting from mining operations takes place on steep slopes. This is no doubt due to the influence of draw as shown in Figs. 13 and 14, where the dotted line indicates the original surface contour. Rapid horizontal movement on a large scale in surface rocks has a more disastrous effect than subsidence, so far as buildings are concerned, for usually the rocks become badly fractured, and in many cases landslips result.

(12) *General Geological Structure of the Absolute Roof.*—In strata which have been compressed into synclinal and anticlinal folds by earth movements, the action of the subsiding mass will be different from that of horizontal strata.

SUMMARY.

The ratio between subsidence and draw must be the joint result of the forces liberated by the withdrawal of support from underneath the strata in the mined area. The larger the proportion of settlement resulting in subsidence the less can occur in the form of draw, and *vice versa.* The more effective is the packing the less the amount of settling that can take place either as subsidence or draw, and as the settlement would be likely to occur slowly the strata would bend without fracturing. Where fracturing does occur, the change of strain in the rock particles in that portion of the strata which is leaving the littoral zone and passing into the motive zone will be rapid, producing noises known among miners as "bumps," "thuds," "crumps," "bowks," etc., and which are usually accompanied by sudden falls of roof and side. The number of factors that may influence the results produced by the settlement of mined strata is so great that only a wide and comprehensive inquiry by geologists and mining engineers in those countries where mining is conducted on a large scale can be hoped to provide sufficient evidence to establish a definite theory or theories to assist in overcoming some of the more common dangers due to subsidence.

In discussing the question of Germany with regard to petrol, the *Autocar* remarks that the exact position is that to-day Germany has the whole of her motor spirit supplying countries cut off. She had, continues our contemporary, undoubtedly hoped still to obtain supplies from the Galician fields, and as a matter of fact it is known that great ingenuity was exercised in order to make this one source as secure as possible, for Galicia is capable of sending into Germany far greater quantities of motor spirit than the published statistics of actual imports suggest. The capture of the Galician oilfields by the Russians, however, has practically broken the last link which connected Germany with substantial quantities of cheap motor spirit, while at the same time it has materially strengthened the position of the Allied Forces, inasmuch as from now onwards large stocks can be drawn upon practically in the theatre of war. The transfer of the large stocks of motor spirit which were in the storage installations on the Scheldt, near Antwerp, to England also removes an opportunity which the Germans might have attempted to avail themselves of, to secure at least some portions of their requirements, and at the same time helps considerably to swell the already large reserves of motor spirit in Great Britain.

Piggs Peak.

The secretary writes: "I am instructed to advise you that the board of directors of this company have declared a dividend at the rate of 2½ per cent., equivalent to sixpence per share."

Suspension of German Patents.

Application for licence to manufacture during the term of the war adjustable metal pit props for mines, under a German patent, 27,415 of 1911, in the name of Reinhard, was made in the Patents' Court in mail week by Mr. E. Mills of 9 Harper Street, the Manor, Willenhall, Staffordshire.

Mr. R. Goold, for the applicant, stated that these metal props were likely to supersede the wooden props. They could be adapted at once to any height of passage by a central screw in the tubular column; they were more durable than wood, were easily transferable, and were not expensive in the first instance. They supported transverse rods, which in turn supported the roof. They allowed no chance of collapse. The German patentee was sole proprietor of a firm called the Pitprop and Mining Outfit Company, and his brother had acted as selling agent in this country at an address in Chester Road, Erdington, Birmingham. Mr. Mills had been treating with Mr. Reinhard to buy the English business, but all communications were at an end they could not even get a letter through to him because Mr. Reinhard, as a German of military age, was interned at Newbury. The patentee lived at Crefeld, near Essen. Mr Mills had already applied to the Court for a licence to manufacture a jig conveyor for coal and such like produce, which was part of the business, and as the conveyor and the pit prop were often bought together, Mr. Mills desired to make and sell the pit prop as well. He had an order for 500. He hoped to be able to sell at 17s.; the metal props before had been placed on the market at £1. He offered a royalty of 5 per cent. on the selling price. Mr. Reinhard had expected great things of this pit prop. Mr. Mills was equally sanguine.

The Controller observed that this was a useful appliance, which he imagined would take the place of wooden props. If they were neither being manufactured nor imported in this country, they presented the very type of case which the alien enemies' legislation was specially passed to deal with. "As to recommending that this licence should be granted," added the Controller, "I think you may take it there will not be the least doubt about it."

POSITION AND PROSPECTS OF MESSINA COPPER.

Important Statement by Chairman—Result of Investigation of Policy of Late Board—Present Position of the Company—Erection of Smelters Contemplated.

THE annual ordinary general meeting of the shareholders of the Messina (Transvaal) Development Company, Ltd., was held in mail week in London, Mr. C. F. H. Leslie (chairman of the company) presiding.

The Secretary (Mr. A. A. Kelsey, F.C.I.S.) read the notice convening the meeting and the report of the auditors.

The Chairman, having apologised for the absence of Mr. J. P. Grenfell and Mr. H. C. Hoover, said: Gentlemen, before I deal with the present position and prospects of the company, I hope you will allow me to put shortly before you the circumstances under which I am addressing you to-day. Early in June of this year Mr. Hoover and I were requested by some of the largest shareholders to join the directorate of the company, and we were, in fact, elected directors on June 4. On Saturday, June 6, the failure of Chaplin, Milne, Grenfell & Co., Ltd., the company's bankers, was announced, and also the failure of the Canadian Agency, Ltd. These failures were entirely unexpected by the board, and they profoundly affected the financial position of the company. In consequence of these failures this company has suffered great losses, and I wish to make it clear to you that prior to the date of our taking office neither Mr. Hoover nor myself had been in any way associated with this company or with the Canadian Agency, and we do not take any responsibility for anything that was done prior to that date. At the earliest possible moment we issued to you an audited statement, which is embodied in the report, dealing with these matters, and shortly afterwards I asked the largest shareholders to meet the reconstituted board. At that meeting about 450,000 shares were represented. I informed the shareholders present at that meeting of the position taken up by Mr. Frecheville and Mr. John Grenfell, who were members of the board at the time these transactions took place. They regarded Mr. Arthur Grenfell (the late chairman of the board) as the financial head, both as to supplying the company with money and to its lending, when the company was in funds, and they had no reason but to place the highest trust in his capacity for performing this duty. At the same time, they had steadily, but ineffectually, protested since January last against the financial transactions which were taking place—transactions with which they had no sympathy, and of which they did not in any way approve.

POLICY OF LATE BOARD.

I have personally investigated this matter, and I believe this statement to be correct. I think the responsibility for these losses should fall, where it ought to fall, on your late chairman (Mr. Arthur Grenfell). He at this time held, together with the Canadian Agency, of which he was the chairman, the controlling interest in the company, and in virtue of that position was able to, and did, control its financial policy. He has filed his petition in bankruptcy, and I am satisfied that even did an action lie against him for the recovery of any of these losses, as to which I express no opinion, such action would be fruitless of result in that it would produce no money. For these reasons Mr. Hoover and I, who are the independent members of the board, and who have had nothing whatever to do with these matters except the responsibility which we have undertaken of straightening them out, are of opinion that the whole of these transactions should be written off and put behind us, and we beg you to adopt this course, because we believe it to be in the best interests of the company. Towards meeting losses in connection with loans made to the Canadian Agency, Ltd., we have written off £92,000, as has been stated in this report, and it will probably be necessary to make a further provision for these losses. I have some diffidence in giving an opinion as to what that further provision will be, and I hope I may turn out to be right in expressing an opinion that it should not exceed £50,000. I do not think I need allude further to the balance sheet and profit and loss account, except to call your attention to the fact that, apart from the necessity of writing off out of the year's revenue £18,000—which was stated as a credit in the previous year's balance sheet under the heading of ore concentrates - the profit and loss account for the year under review would have been £62,800, instead of £44,800.

FINANCIAL POSITION.

With regard to the financial position, as I have told you, I am not responsible for it; but I have seen to it that the whole facts in connection with it and the causes of it are fully set forth in the report. Perhaps, however, you hardly realise some of the difficulties with which we were confronted when we had suddenly to meet large liabilities immediately falling due. We were under contract with the Government of South Africa not to issue any further debentures, so that finance in that direction was impracticable, and we could neither issue ordinary nor preference shares, because the whole of the reserve shares, in round numbers 273,000 shares of 5s. each, were under option till March 1, 1915, and by the terms of those options any further issue of ordinary or preference shares was prohibited. And that was not the end of our difficulties; for we found that on March 1, 1915 the date of their expiry, so far as the present option-holders are concerned the options outstanding did not revert to the company, but reverted for a further fifteen months to the Canadian Agency, Ltd., which was already at that time in liquidation; so that while large sums of money were immediately wanted -namely, £50,000 to £100,000 - it was difficult to see what consideration could be given in exchange for that credit. Eventually we bought out the situation from the liquidator of the Canadian Agency for a cash payment of £300, and were then in the position of regaining possession of the option shares as from March 1, 1915, in the event of the options not being exercised before that date. This was the position on or about July 20, and we then made arrangements for the issue of some of the reserve shares, subject to the options outstanding not being exercised; before, however, this arrangement could be completed, Germany had declared war on Russia, and its completion became impracticable. Eventually we were able to make the arrangements with our bankers and with the Interguarantee Syndicate, Ltd., for the finance of the company, which are set forth in the first paragraph of the report on page 5. The consideration which this company gave to the guaranteeing company was the right for one month after the outstanding options had expired to call upon this company to issue to the shareholders up to 170,000 of its reserve shares at a price to be agreed, but at not less than 10s. per share. The issue, if made, was to be underwritten by the guarantee company for a commission of 5 per cent., and the guarantee company was to have the call of the remaining 100,000 reserve shares till January 1, 1916, at 10s. per share. To enable the company to make this arrangement it was necessary that both Mr. Hoover and I should participate in this guarantee; and I take the earliest opportunity of saying that if any shareholder wishes to occupy our position and accept our liability in this respect, he is quite welcome to do so.

REPORTS FROM THE MINE.

As to the position of the mine itself. This has been very fully dealt with by Mr. Calderwood and Mr. Frecheville in their respective reports, and without going into details I will give you some conclusions which may be safely made from their reports. We have three years of ore in sight; we have a further year and a half of ore partly proven, and we have good ore at the bottom of the mine, which may be taken as giving us at least another year, and this is exclusive of any prospect of further development laterally, which further prospect your board regards as being good. When opportunity offers your directors will commence a vigorous development campaign, both in depth and laterally. For the moment development is being curtailed, a policy which every director of a mining company cordially detests; but we have come to the conclusion that it is more important to have cash at the present time than to maintain or increase our ore reserves, and you must not think that the mine is coming to and end should, at this time next year, the ore reserves be reduced; you must regard the phenomenon, should it occur, as part of a deliberate policy adopted at a time when affairs throughout the world are abnormal, and when money is scarce. I also wish to tell you that, apart from this mine which we are now working, there is a really good prospect in the adjoining farm Vogelzang, which is owned by our company, and that exploration should be proceeded with on this farm at the earliest possible opportunity which our finances will permit. With regard to the profit realised from the working of the mine and the mill, you must remember that the year under review was subject to considerable fluctuations in work, brought about mainly by the putting into operation of the new mill as from January last and by a consequent increase in output during the latter months, and without going into technical details I will give you a few figures based on the output of the last few months, on which I think you can rely.

ESTIMATED PROFIT.

At the present price of copper, namely, £55 for best select, and with a continuance of the present methods of working, the net profit for the current year should amount to not less than £50,000, and it is possible that this figure may be exceeded. I think, therefore, that our finances are on a reasonably secure basis. To establish an absolutely secure basis of finance must be the necessary preliminary to the distribution of dividends, and it may be that the whole of the above-expected profit will be required for this purpose; but the ultimate object of our work is the earning and distribution of dividends, and we must endeavour to arrive at this stage at the earliest possible moment. We have therefore come to the conclusion that instead of making copper concentrates and selling them to other parties for treatment we must produce and sell copper. When we can do this your annual profit, taken on the same basis of £55 for copper, will be £100,000, instead of £50,000, and will be derived from the same amount of ore. We have on or near the property the necessary coal and fluxes for the attainment of this object:

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TEACHING CENTRES:—{ JOHANNESBURG AND SCHOOL OF MINES, KIMBERLEY.

Prof. YATES prepares candidates for the following Government Certificates:—
MINE MANAGER'S.
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by Class, Private Tuition, and Correspondence.
SOME 1914 RESULTS:—
MANAGERS - - - January and May - - - ALL Passed.
ELEC. ENGINEERS - February - - - - - 66% ,,
MECH. ENGINEERS- June (Kimberley Centre) - - ALL ,,
MINE OVERSEERS - - - - - - - Practically ALL ,,
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the one thing we lack is the necessary capital for the purchase and erection of the plant. I hope in the course of the next year it will be possible to issue 200,000 of our reserve shares at not less than 10s. per share—a premium of at least 5s. per share. This issue would give the company a further £100,000 of cash. We shall require probably £50,000 for the new smelter plant at the mine and hauling gear and plant at the colliery; and the remaining £50,000 would put our finances in order. In these circumstances the nominal capital of the company would become £230,000, and the annual profit would become £100,000. The premium derived from the issue would wipe out the losses incurred in connection with the loan to the Canadian Agency, and the net earnings would immediately become available for distribution. Of the £100,000 of profit £35,000 would be required for the redemption of debentures and £65,000 or thereabouts would be available for dividend, and would give a good return on the capital invested. We are of opinion that this scheme of producing copper, instead of concentrates, could be in operation within twelve months of the giving out of the orders connected therewith. I believe this proposition is based on a sound premise, namely, the price of best select copper at £55 per ton. This basis price is much lower than the average price of best select copper for the last fifteen years, which, according to the available statistics, has been about £70 per ton; and I hope it will be possible to put our proposals into execution by April next year.

QUESTION OF PROFIT STATEMENTS.

There are only one or two other points I wish to mention. The first of these is the discontinuance of the estimated monthly profit statement. The reason we have discontinued these figures is that they have proved to be misleading. The facts in connection with the production and sale of ore concentrates and matte are as follow: Shortly after the end of each month we know our cost of production in South Africa, but the concentrates take about three months in transit between the mine and the consumer in England, and it is not till after these three months have elapsed that we know what price has been realised. In recent months copper has had a fall of £15 per ton or more, and you may take it that a fall in the price of copper to the extent of £1 per ton affects our profits to the extent of £5,000 a year, and it is owing to this great fluctuation in the recent prices of copper that the figures given to you have been misleading. The board is considering how it can keep you regularly advised of the progress of the company, and we hope shortly to find some formula which will give you regular and reliable information. I can conveniently bring this information up to date by telling you that, notwithstanding the difficulties and increased costs imposed by the war, the net profit for July, August, September, and October of this year should not be less than £20,000. The second point on which I wish to inform you is that we have appointed Mr. Emery to be general manager at Messina. Mr. Emery comes to us with a well-earned reputation for successful work in other countries, and possesses a knowledge of mining and metallurgical work which I am confident will prove of great value to this company. And, lastly, in the midst of all our difficulties here, we must not forget the thoroughly good and capable work which has been done for the company in South Africa by the Messina staff, and I wish publicly to acknowledge the services rendered to the company by Mr. Calderwood, Mr. Woodburn, and Mr. Stuart, and the rest of the staff in South Africa. I have explained to you as shortly as I can the present position of the company, and I have indicated its present, as well as its prospective earnings and possibilities, and I now move that the report of the directors, together with the balance sheet and profit and loss account for the period ended June 30, 1914, now before you, be received and adopted.

Mr. R. J. Frecheville seconded the resolution.

The Chairman, in reply to questions, said in his view all moneys belonging to a company should be used solely and exclusively for the purpose of that company, if circumstances arose under which the money could not be immediately used for that purpose, it should be placed on deposit at some first class bank or lent on gilt edged securities. With regard to the value of the securities held against loans, he had considered it his duty on that occasion to tell the shareholders the worst. With regard to the Canadian Agency, the board were doing their utmost to protect the interest of the shareholders. His calculation as to profits had been made on a very conservative basis. In conclusion, he stated that the National Bank of South Africa were at present their sole bankers.

MESSINA MINE CONCENTRATOR.

The resolution was carried unanimously.

The retiring directors (Messrs. C. F. H. Leslie and H. C. Hoover) and the auditors (Messrs. Allen, Attfield & Co.) were reappointed, and the meeting closed with a vote of thanks to the chairman.

East Rand Proprietary Mines.

The tonnage treated during the third quarter of the year at the E.R.P.M. had a good effect upon working expenses. This is here shown:—

		Working Costs per Ton.		
Quarter.	Tons Milled.	Mining.	Reduction.	General.
March	385,600	12/10	4	2/
June	453,000	11/6	4	1/6
September ...	512,350	10/3	3/5	1/3

By quarters the total working expenses per ton were:—March, 21s. 10d.; June, 19s. 11d.; September, 17s. 11d. These results are very creditable, especially when it is remembered that in the March quarter the average yield was 29s. 2d. and in the latest three months 26s. 8d. Working profits have advanced in the three periods thus: March, £142,106; June, £186,994; September, £225,035. It is not surprising from this standpoint that East Rands are being picked up. The cash position is very strong—£179,519 after all liabilities (except debentures), and in addition £282,505 to credit of development suspense account. Development results compare thus:—

	Feet Sampled.	Average Value.	Average Width.
March quarter	8,374	10.3 dwts.	27 in.
June quarter	9,772	9.8 dwts.	28 in.
September quarter ..	10,263	9.5 dwts.	28 in.

Spitzkop Farm Gold.

The report of the Spitzkop Farm Gold Company, Ltd., for the year ended June 30 last shows that the gross revenue amounted to £2,334, and, after charging the concession dues and other expenses in South Africa and in London, there remains a net balance to credit of £968.

A.B.C. Dividend.

The annual report of the African Banking Corporation, Ltd., for the year ended the 30th of September last, shows that the gross profit was £231,491. The directors recommend a dividend for the half-year ended the 30th of September last of 4 per cent., making 6 per cent. for the year. It is proposed to carry forward the sum of £27,477.

Premier Diamonds.

The directors of the Premier (Transvaal) Diamond Mining Company, Ltd., announce that the declaration of dividend No. 20 on the preference shares has been postponed.

HIGH MINING SALARIES

For those holding Certificates as Mine Managers, Mine Surveyors, Mine Captains, Mechanical and Electrical Engineers and Engine Driver. Private Individual Tuition and Correspondence lessons where personal tuition is impossible. Practical Mathematics and Electrotechnics. E. J. MOYNIHAN, Consulting Engineer, 45-6, Cuthberts Buildings, Box 2061, Johannesburg.

Rhodesian Section.

LATEST MINING NEWS.

Features of the November Output—Selukwe Columbia—United Rhodesia Gold Fields—Wankie Colliery—Rhodesia-Katanga Junction Railway Proposed Lease—

Some of the output returns for November from the more important Rhodesian mines are now to hand, and all are of a very satisfactory kind. The Globe and Phoenix produced gold to the value of £40,265. The Eldorado Banket output was valued at £18,052, yielding a profit of £12,043. The extra profit is due to a special clean-up and to the working of a rich patch. At the Falcon the blister copper and gold produced were valued at £27,230. In addition, 1,000 tons of concentrates are held over till the extension of the sintering plant is completed, probably about April. The product is being shipped to New York and the profit is not available. The total value of the Shamva yield was £27,081, and the profit is estimated at £10,320. At the Golden Kopje, owing to a breakdown of the mill engine, the mill only ran 18 days, and gold to the value of £8,046 was produced. Full details of the output will appear in our next issue.

* * * *

A surprise was sprung on shareholders at the recent meeting of the Selukwe Columbia by the proposal to pay a dividend of 3s. per share. This calls for a sum of £21,037, whereas the profit for last year was only £9,579, but the balance brought forward was £19,621. As the chairman explained, the distribution must be regarded as representative of the profits spread over the last three years. The company is fortunate in possessing a cash balance of £65,769, so that, after paying the dividend, it will still have a large sum available for capital expenditure in connection with the Wonderland claims, which are opening up promisingly. Since the end of the financial year it is estimated that 10,000 tons have been developed on this area, making the total ore reserves, on a conservative estimate, 30,000 tons, sufficient to keep the mill in course of erection, with a capacity of 1,250 tons per month, going for about two years.

* * * *

The report of the United Rhodesia Gold Fields for the year ended 31st July last, presented at the meeting on the 1st December, states that the company's gold mining claims at 31st July numbered 609. During the year a further ten claims have been sold to the Just-in-Time Gold Mining Company for 1,000 fully-paid shares of that company. If conditions are favourable it is intended to start development in the early part of next year. A considerable amount of work was done on the Hibernian property, but the results were indefinite. The property is now under option of tribute to certain parties. The profit and loss account shows a debit balance of £16,197. The auditors in course of their report remark:—" The published prices at 30th July, 1914, of such of the shares and debentures in other companies as had published prices (about three-fifths of the whole) showed in the aggregate a deficiency of £64,000. The remainder are included at the directors' estimate. We are not able to verify the value of the properties and a part of the sundry debtors."

* * * *

The report of the Wankie Colliery Company, Ltd., for the year ended 31st August, 1914, presented at the meeting on the 8th inst., states that in order to enable the company to increase its plant and its output of coal to carry out a further contract entered into with the Union Miniere du Haut Katanga for the supply of large quantities of coal and coke, additional working capital was raised during the year, the authorised debenture debt being increased to £100,000, the additional £60,000 being issued on the 8th April last at par. The operations for the period under review, after writing off depreciation, have resulted in a profit of £56,236. The directors recommend a dividend for the year of 25 per cent., less income tax. An instalment of 10 per cent. on account of this dividend was paid on 30th March. The payment of the dividend will absorb £50,654, leaving £21,260 to be carried forward, from which has to be deducted £1,798 for the directors' additional remuneration. The sales of coal and coke amounted to 239,969 tons and 17,272 tons respectively. In addition to the existing contracts with the Union Miniere du Haut Katanga which expire on the 30th June, 1915, a further contract has been entered into with that company under which it will take its requirements for lump coal, washed coal and coke for use at its smelting works at Elizabethville, in Katanga, for a period of ten years from 1st July, 1915, the minimum quantity to be taken annually being 100,000 tons, of which not more than 60,000 tons shall be coal and at least 40,000 tons coke. The contract also includes the supply of ground and unground fireclay, ordinary and special firebricks. In view of the satisfactory progress of the company since its re-formation in 1909, it is considered that the time has now arrived when the capital should be reorganised and placed on its original basis, and the shareholders will be asked to sanction resolutions for this purpose. It is proposed that a new company be formed, to be called the Wankie Colliery Company, Ltd., with a capital of £410,000, divided into 820,000 shares of 10s. each, shareholders in the present company receiving two fully-paid shares of 10s. each of the new company for every one share of 10s. each at present held. Of the 820,000 shares (the proposed capital of the new company), 810,466 shares will be thus issued to the shareholders in exchange for their old shares, leaving 9,534 shares in reserve. The new company will also create £93,000 debentures to be exchanged for a similar number of the existing debentures, the present company paying off the £7,000 redeemable on the 31st December next and interest on all the debentures to that date.

* * * *

A meeting of the holders of first mortgage debentures of the Rhodesia-Katanga Junction Railway and Mineral Company, Ltd., was held at the registered office of the company, Friars House, New Broad Street, E.C., on Monday, 23rd November, to approve a proposed lease by the Rhodesia-Katanga Junction Railway and Mineral Company to the Rhodesia Railways, Ltd., and the Mashonaland Railway Company, Ltd. The following is an official report of the proceedings:—

Baron E. B. d'Erlanger, the chairman of the meeting, stated that the object of the meeting was to obtain the consent of the debenture holders to a lease by the Rhodesia Katanga Company to the Rhodesia

WANTED.

ROCK BREAKERS.

Two first-class men are wanted for rock sections on irrigation works. Applicants must have Miners' Blasting Certificate, and be capable of taking over full charge of work.

Apply, enclosing testimonials and stating salary required, to Christie & Co., Hofmeyr, Cape Province.

Railways, Ltd., and the Mashonaland Railway Company, which arrangement he considered was eminently satisfactory to the debenture holders, but according to the trust deed the arrangement required over half the debenture holders in value to be represented at the meeting so as to form a quorum and an extra-ordinary resolution to be passed by those so represented. Consequently in order to form a quorum it was necessary to have holders of debentures representing over £400,000 present in person or represented at the meeting, whereas the total representation was only £321,000; it was therefore necessary, in accordance with the provisions of the trust deed, to adjourn the meeting for 21 days hence, and at the second meeting a quorum would be constituted by any debenture holders then represented. For the benefit of those debenture holders present he would give a synopsis of the arrangement which they would be asked to sanction at the adjourned meeting so that the details might become familiar by means of the Press to any debenture holder who was not present. The first mortgage debentures of the company were secured by a mortgage of the line of the Rhodesia Katanga Company and other assets of that company, and these debentures were guaranteed by Tanganyika Concessions, Ltd. Now, after lengthy negotiations, it had been decided to lease the Rhodesia Katanga Railway to the two companies, the Rhodesia Railways, Ltd., and the Mashonaland Railway Company, Ltd., which were two important railways operating in South Africa, and that they should become the lessees of the railway and should work the whole of such railway. This would give a considerable additional security to the debentures, because both the lessee companies were important and flourishing concerns, and under the lease they were to pay as a minimum rent for 25 years an amount equal to the annual interest on the debentures. With regard to the surplus earnings, the debenture holders were not interested in them, but they would be divided between the Rhodesia-Katanga Company and the lessees of the railway. Consequently, besides the earnings of the Rhodesia-Katanga line, which had since the beginning been sufficient and had often exceeded the amount to cover the service of the debentures outside of the guarantee of the Tanganyika Company, the holders would have practically the whole of the assets and the net earning capacity of the Rhodesia Railways and the Mashonaland Railway Company to look to for the interest on the debentures. Considering the net earnings of those two railway companies, it was plain that the Rhodesia-Katanga debenture holders' security was being benefited by the granting of this lease for 25 years to these railway companies. The Chairman, therefore, strongly recommended the debenture holders to approve this lease as being highly beneficial to them.

THE YEAR WITH THE PICKSTONE.

THE report of the directors for the year ended 31st July, 1914, submitted at the second ordinary general meeting of shareholders, convened for Wednesday, the 16th December, 1914, at the head office of the company, Duchess Hill, Southern Rhodesia, shows, briefly, that there is a difference of £3,162 between amount spent on capital account and amount available for appropriation, being liabilities at 31st July, 1914, over cash and cash assets. The profit was £4,981. The directors add: "The shareholders will readily see from the foregoing figures that the company has been hampered from its initiation by lack of working capital, and they will be asked to sanction a scheme for the raising of sufficient capital to put the company in a better financial position, in order that the profits which are made may be available for distribution amongst the shareholders in dividends."

The Manager, in his report, writes, *inter alia*:—The year under review, the second of the company's existence, has differed from the previous year inasmuch as the work has been one of endeavour to consolidate the company's interests and accumulate reserves, as opposed to the conservative activities of the previous year. The plant is now fully completed in all its details, and a policy of vigorous development has been prosecuted in the two sections of the property, viz., Pickstone East and Pickstone West mines. A detailed account of these developments will be found in the report of Mr. R. W. Pringle, A.R.S.M., M.A.I.M.E., etc. The striking of the ore bodies in the 200 feet level of the Pickstone West mine is the item of development which calls for special mention. At 224 feet from the vertical shaft the first sulphide ore was encountered in the main crosscut, and from there southwards, for a distance of 62 feet, successive bodies of sulphide ore, consisting of impregnated schist and shale, more or less mineralized, were encountered. These deposits prove the continuity with depth of the ore bodies met with in the upper portions of the mine, and several encouraging features have to be recorded. In conclusion, I consider the year's work, though disappointing in some respects, affords in other respects ground for congratulation. The development upon the 2nd level of the ironstone body, upon the results of which the future of the mine may be said to have rested, has demonstrated that not only has the ore body continued to that depth, and maintained the average value found in the upper levels, but it now shows payable values in the north-eastern section which, in the upper levels, was unpayable. There is every reason to suppose that the ironstone body is one which may be expected to continue to considerable depths, thus ensuring long life to the mine. The plant is giving every satisfaction, and the outlook for the company has indications of steady progress which should contribute to the realization of the results originally predicted for the enterprise.

Imperial Loans to the Colonies.

In a Treasury Minute, dated November 17, relating to advances to the self-governing Dominions, the Chancellor of the Exchequer calls attention to the arrangements which have been made with the Governments of certain of the Dominions, with a view to avoiding the disadvantages of the separate flotation by each Dominion of the loans required to meet the heavy expenditure entailed by the present crisis. So far as they can be estimated at present, the amounts required are:—Canada, £12,000,000; Australia, £18,000,000; New Zealand, £5,250,000; South Africa, £7,000,000. It is proposed that the sums required by the Dominion Governments from time to time should be advanced to them out of the proceeds of any general war loan or loans which may be raised by His Majesty's Government—*i.e.*, of any loan raised otherwise than by short-term securities, such as the six or twelve months Treasury bills, by which the cost of the war has hitherto been provided for. The object of these advances is to provide funds to meet the Naval and Military expenditure incurred by the Dominions and other charges directly due to the crisis. They are not intended to be applied to financing development services. The sums advanced are to be applied primarily to meet the obligations of the Dominions in the United Kingdom in respect of debt services and purchases in the English market. Save in very exceptional circumstances, no part of the advances is to be used for cash remittances from the United Kingdom. The money will be lent at the rate of interest at which His Majesty's Government itself will have borrowed, the discount on any interest-bearing securities issued at a discount being added to the capital of the debt. The amounts paid over to the Dominions from time to time in respect of the advances will be charged to the Vote of Credit. The debts due to His Majesty's Government from each of the Dominions will be paid off out of public issues of stock or securities to be made at such times as may be agreed upon as suitable between the Chancellor of the Exchequer and the Dominion Government.

New Patents.

415. Robert Killoch Donald. Improvements in and relating to cradle crushers.
416. M. F. Sherwell, Ltd., and James Henry Cowle. Improvements in rock drills or rock drilling machines.
417. Samuel William Bradbury. Light armour for vehicles, buildings and the like.
418. Sydney Hobbs, Alfred Osborne Glisson, and A. Hunter Smith. The detachable grip band for the wheels of road vehicles and the like.
419. William Charles Stephens. Improvements in or connected with rock drilling machines.
420. Edgar Rouse Sutcliffe. Improvements in the manufacture of tiles, roof sheets and the like.
421. Henry Jewett. Improvements in locks and bolts for doors.
422. Thomas Percival Woodhead. Improvements in hangers and the like supporting devices.
423. David Christopher Reinhol. Improvements in recovering precious metals from their ores.
424. John James Kinleyside and William Bottom. Improvements in mine signalling apparatus.
425. Joseph William Forster. Improvements relating to drills for hand rock drilling.
426. Henry James Lewis and William Taylor. Improvements in devices for emptying the contents of cans into receptacles.
427. William Elijah Elliott. Improvements in mounting for combined shoe button and staples.

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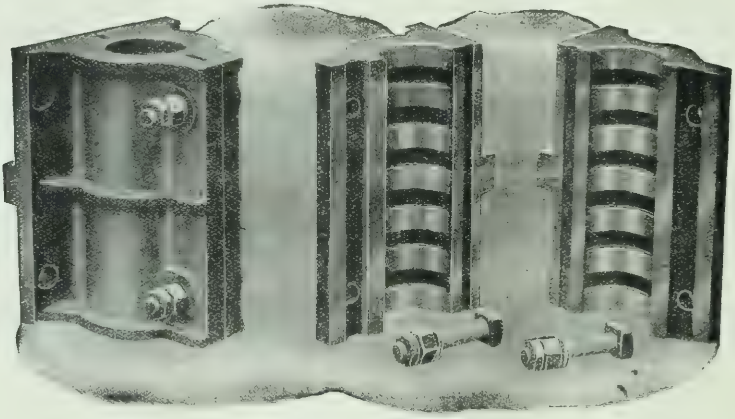

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WORKS:
VENTERSBURG ROAD, O.F.S.

Engineering Notes and News.

Underground Transportation.

Mr. O. P. Hood, in a paper prepared for the October meeting of the American Institute of Mining Engineers, says: "None of the methods now in use for the transportation of materials underground is entirely free from more or less serious objection. The great flexibility, ease of control and economy of operation of electric tramming are accompanied by the serious menace of a trolley wire distributing system. As the gasoline locomotive has even greater flexibility of application and requires no similar dangerous distributing system, it might be considered a safety device which would make possible the elimination of the dangerous trolley system were it not possessed of other objectionable qualities peculiar to itself. It is found that the exhaust gases from the engine may be injurious to the health of those breathing the air in which the locomotive has been operating. While electric shock may kill the individual who makes contact with uninsulated parts, the gasoline engine may be detrimental to the health of all those who have to work within the atmosphere corrupted by exhaust gases. The degree of pollution measures the magnitude of the menace. This may be negligible at times, but with careless operation it becomes serious. The exhaust gases from an engine are composed of nitrogen, a little free oxygen, hydrocarbons, hydrogen, carbon monoxide and carbon dioxide, the last two being considered dangerous.".

Electricity and Agriculture.

In an early issue we hope to publish an article on the application of electricity to agriculture. On the Continent a great deal has been done in this direction, and we have no doubt that in a short time this matter will receive attention here. In a paper read a few weeks ago in America, the author, Mr. J. E. Davidson, pointed out that a company cannot afford to supply electricity to a rural territory unless the yearly revenue is equivalent to 50 per cent. of the cost of construction of the extension, including the usual overhead expenses. Contracts for rural electric service should be closed before construction work is started, and they should cover a period of not less than 10 years, and preferably 15 or 20 years. The author recommended rates made up of a fixed charge based on the maximum peak demand for a season with an additional meter charge based on the peak demand per month. Irrigation pumping by electricity can be made desirable for consumers and profitable to the central station company if a large installation is made to serve several large tracts in rotation. Data from actual installations rated at 2 horse-power to 20 horse-power were also included, covering the number of acres irrigated per horse-power and the cost of energy per acre per annum. The average cost of energy per acre irrigated was £1 3s. a year. By installing motors to pump water and operate farm machinery in the Yakima Valley, Washington, the Pacific Power and Light Company has provided itself with a load which brings in £10 per horse-power per year.

* * * *

Boom in British Engineering Trades.

" 'Tis an ill wind——." It seems but yesterday that the engineering trade throughout the country was suffering from almost as great a depression as was occasioned by the strike in its allied industry, the building trade, says the engineering correspondent of a London contemporary. But the war has changed many things and many businesses. It has brought people to their senses, especially those who control trade organisations, and are now conducting their affairs with far more level-headedness than formerly. No sooner had hostilities commenced than the building trade dispute was abruptly terminated, and many of the great undertakings in the West-end of London which had been left neglected for months are now in a fair way to completion. While the outbreak of the war did a good turn to the building trade, it has affected the engineering industries of the country to an unparalleled degree. Business, instead of being stagnant, is rampant. There never were such times. Manufacturers in the Midlands and in Yorkshire know not which way to turn. Their works are running at the greatest pressure. Orders are rolling in, and the chief trouble of the recipients is to let their customers know when they may expect delivery. Of course, Government orders take precedence, and heavy steel firms at Sheffield have never experienced such big business. Many manufacturers are enlarging their plants, and unemployment is almost unknown.

Brakpan Mines.

The secretaries write:—We are directed to give you the following information in respect to the November, 1914, output: Stamps working, 140; running time, 28 days; ore crushed, 53,050 tons; tube mills working, 9; ore hoisted, 59,867 tons; ore from dump, nil; waste sorted, 13·69 per cent.; fine gold declared, 17,529·18 ozs.; value declared, £73,789, equal to 27s. 9d. per ton milled; working costs, £49,401, equal to 18s. 7d. per ton milled; working profit, £24,388, equal to 9s. 2d. per ton milled.

THE YEAR WITH FRASER & CHALMERS.

Profits Increased—Operations of Current Year—Improved Business in the Union and Rhodesia.

THE ordinary annual general meeting of Fraser & Chalmers, Ltd., was held recently at Winchester House, Old Broad Street, London, E.C., Mr. A. W. Tait (chairman of the company) presiding.

The Chairman, having expressed regret at the great loss the company had sustained by the death of Mr. Robert English, the late chairman, said: The net result of the year's trading, after providing for all expenses and proper depreciation on buildings, plant and machinery, is a profit of £8.377, as compared with £4,604, or an increase of £3,773 over the previous year. Although the amount of net profit cannot be regarded as satisfactory, it is encouraging that some progress has been shown as compared with the previous year. The works at Erith have been fairly well employed during the year, although there has been some falling off in certain departments during the close of the period. Considerable progress has been made in the manufacture and sale of steam turbines and turbo-blowers. The machines which the company has manufactured have given every satisfaction, and show that the company is now well able to compete both in efficiency and cost with other manufacturers in this line of business, and the orders which have been obtained and the inquiries which are in hand encourage the board in the belief that this department will steadily grow in importance. The company are also becoming fairly well known in this class of manufacture and the field for expansion is considerable. With regard to gas and oil engines, there is little or nothing to report, except that the gas engines which we have supplied have given excellent results in working. In coal handling and conveying machinery the business has increased, and several important orders were uncompleted at the close of the accounts, among which I may mention that of the Durban Coal Storage plant, the order which was secured last year. This department gives indications of growing into an important branch of the company's business. I regret to report that, with regard to Bettington boilers, in spite of continued excellent commercial results of the running of these boilers in a number of places, including our own works, we have not made much progress during the year. With regard to mining machinery, in the manufacture of which the company is so well known, the business has not been good, but, in view of the conditions of the mining industry and the conditions which have now arisen owing to the war, this is not altogether unexpected, and unless and until there is some considerable revival in that industry, either by the discovery of new fields or increased development in existing mining fields, there is not much prospect of improvement in this department. The business of the manufacture of dredges has increased during the year, and there is reasonable prospect of further improvement in this department, although you will appreciate that the demand is a somewhat irregular one. Our designs and work are now approved by experienced engineers, who formerly would only endorse American-built dredges.

COLONIAL BUSINESS.

The South African general business has been well maintained during the year, and the directors are always on the look-out for new lines of business or manufacture, which could be satisfactorily dealt with in that country. The rearrangement of our offices and staff in Rhodesia has led to a decrease in expenses without interfering with its efficiency, and the results from this territory show an improvement during the year. With regard to Canadian business, I have to report that the results for the year are not so satisfactory as those of the previous year, but this is not surprising, in view of the financial conditions which have been ruling in that country during the period.

GOVERNMENT CONTRACTS.

The shareholders will, no doubt, desire some expression of opinion as to the position of the company's business since the close of the year, particularly in view of the state of affairs which has been created by the principal European countries being at war. After the outbreak of war there was a falling off in the number of orders and inquiries for Erith manufactures. I am pleased to say that lately there has been a much better tone, and there is every prospect of a reasonable number of orders being obtained, although it is hardly to be expected that the normal volume of business will be secured during the current year. We are now executing a certain amount of work for the War Office and for other manufacturers who are engaged on similar work, and we are also hopeful that we may obtain a certain amount of business from the Admiralty, for which our works are suitable. We are also endeavouring to follow up all inquiries and possible avenues of new business, and in this connection we might mention that we are seriously looking into the prospects of the field for our manufactures which will be opened up in Russia after the present war has been concluded. The whole of the expenditure of the company is from time to time carefully reviewed by the board, and I consider a very important step was taken in the increase of the efficiency of the business when nearly the whole of the London staff was removed to Erith. I will now formally move that the report and accounts for the year to 30th June, 1914, be received and adopted.

Mr. C. E. Atkinson seconded the resolution, which was carried unanimously.

The retiring directors (Messrs. C. E. Atkinson and W. E. Rommel) and the auditors (Messrs. Deloitte, Plender, Griffiths & Co.) were re-elected, and the meeting closed with a vote of thanks to the chairman, directors and staff.

TO CONTRIBUTORS.

The Editor invites Contributions on any subject of interest relating to mining and other industries of South and Central Africa, as also of suitable non-copyright photographs or snapshots of mining or engineering interest. Subject to special arrangement, the scale of remuneration for all articles inserted is at the rate of Two Guineas per page, and 5/- for every photograph. No responsibility can be accepted for safe transmission, but anything that may be submitted that is not accepted will be returned if a stamped and directed envelope is enclosed for the purpose.

AMUSEMENTS.

NEXT WEEK'S PROGRAMME.

His Majesty's—J. C. Williamson's Co.	8.15
Empire—Varieties	8.15
Palladium	8.15
Carlton	7 to 11.15
Orpheum	7 to 11.15
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Commerce and Industries.

The "A.E.G."

The latest annual report of the A.E.G., after referring to the motor-car department, which is carried on by a separate company in which the A.E.G. holds all the share capital, mentions that since the outbreak of the war this separate company has been employed almost exclusively on army contracts. During the year the constructional activity for mines and ironworks was slack and the orders were mostly those remaining over from the previous year's programmes of light dynamos, motors for pumping, ventilators and winding and rolling train machinery, cranes and other auxiliary machinery were scarcely less in extent than in 1912-13. Several of the electricity works and overland stations erected by the company in Germany were brought into operation or were still in progress. Abroad there were being carried out an extension of the Brakpan station for the Victoria Falls and Transvaal Power Co., the electrical equipment of the hydro-electric works of the Ebro Irrigation Co. of Barcelona, the extension of the Campina station (12,000 k.w.) in Roumania, equipment for 10,000 k.w. at Pruschkow, Russia, 15,000 k.w. for Lisbon, 15,000 k.w. for the new tramway power station at Petrograd, and 5,000 k.w. for a power station at Malino. The tramway and light railway department yielded satisfactory results. It is shown that the war is severely affecting the business of the company.

* * * *

Sugar Purchases by the Imperial Government.

The supply to the United Kingdom of large quantities of sugar will be cut off during the war, owing to the fact that for some years past it has become dependent on the refineries of Germany and Austria for a disproportionate amount of stocks. The rapid advance in prices on the outbreak of hostilities called for prompt action, and the Government appointed a special Commission of Enquiry, with powers to adopt necessary measures for dealing with the situation. As a result, purchases have been made from Java, Mauritius, and the West Indies to the value of £18,000,000 on behalf of the Government, which has undertaken the supervision of these supplies and their distribution on such terms as shall ensure retail prices of sugar being maintained at a scale only a little higher than that which obtains in normal times. This transaction has been criticised on grounds of strict political economy, but security is a great asset, and the crisis demanded unusual measures. As an emergency method of preventing an abnormal rise in price there is much to be said in favour of the action of the Commission, though more continuous and lasting security might be obtained by the energetic support of the possibilities of supply by the overseas possessions and from the home beet-growing industry, which has somewhat parallel conditions of opportunity and should receive similar encouragement to that given by Napoleon to beet-raising in France a hundred years ago. The true significance of the Government's action has, however, only recently become clear. The Germans and Austrians have gradually ousted from competition British sources of supply which for want of support and foresight have been allowed to languish. Sugar is one of the most important exports of Germany and Austria and one of the few which they can use, in the form of capital, against their imports from neutral countries. Although it is no longer open to Austria and Germany to send sugar to the United Kingdom, it can be exported to neutral countries, in exchange for much needed commodities, and it can be used for certain manufactures and then sent to our markets. The control by Government of the supply of sugar to our markets now puts an end to that possibility, and strikes a great blow at the German and Austrian trade.

* * * *

Healthy Fumigation Cyanide.

Press Circular No. 22 of the Department of Agriculture states: "The Division of Entomology of the Union Department of Agriculture is now recommending nurserymen and fruit growers, and also house fumigators, to use sodium cyanide in place of potassium cyanide for the generation of hydrocyanic acid gas. The 98 per cent. potassium cyanide has been found to be less reliable than when fumigation first became extensively practised in this country; and although, when true to grade, it is as good for fumigation purposes as it ever was, there are several advantages in giving preference to the sodium compound. The latter is now more readily procurable, is relatively cheaper and is equally efficient for the production of fumigation gas. Two grades of cake sodium cyanide are imported in quantity into South Africa, 120 per cent. and 129-130 per cent. Both grades are suitable for fumigation work; but the 129-130 per cent. one should be taken when it is obtainable if its price is not over ten per cent. greater.

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In small lots 130 per cent. cyanide is now sold in Johannesburg at about 1s. 6d. per pound. Cyanide should give off an amount of hydrocyanic gas proportionate to the percentage grade by which it is known; and in practice 130 per cent. sodium cyanide is worth to a fumigator about one-third more than 98 per cent. potassium cyanide. It follows that three-fourths of an ounce of 130 per cent., or five sixths of an ounce of 120 per cent. sodium cyanide, should be used to replace one ounce of 98 per cent. potassium cyanide. Sodium cyanide of less than 120 per cent. strength, and potassium cyanide of less than 98 per cent. strength should be avoided for fumigation purposes, as their employment involves a wastage of acid and as they are very liable to contain injurious impurities. The amount of commercial sulphuric acid (90 per cent. or stronger) to use with an ounce of 120 per cent. or of 130 cyanide should be full $1\frac{1}{4}$ fluid ounces, and the amount of water should be 2 fluid ounces as in the case of 98 per cent. cyanide."

* * * *

A German S.W. Industry.

Should German South-West Africa come under the British flag, the caracul fur industry of that colony is likely to prove an asset of increasing value. Caracul sheep, which supply the curly black caracul or (to use the trade term) " Persian " lamb fur, were first imported into German South-West Africa from their native Bokhara in 1907, being regarded as specially suited to the sandy soil. Since 1909 there has been a Government farm for the breeding of these sheep near Windhuk. The caracul sheep has been crossed with the native African sheep, with the most satisfactory results, and it is now understood, according to information available at the Imperial Institute, that the industry is an established success, the sheep having found on the higher plateaux of German Damaraland and Namaqualand climatic conditions not far removed from those of their original habitat. Prices as high as £2, or even more, are obtained for an exceptionally good lambskin, but the industry can, it is believed, be carried on at a profit if from 10s. to 15s. are realised per skin. In Natal and other parts of the Union of South Africa, where the sheep have also been successfully introduced, little or no attention seems to have been paid to the production of " Persian " lambskins, the sheep being used there entirely as a source of wool and mutton. A flock of caracul sheep have, however, quite recently been imported into Newfoundland, and the result of the experiment will be awaited with interest. It may be mentioned that Professor Wallace, of Edinburgh, has recently advocated a trial of these sheep in Great Britain, and a promising experiment has been made with them in Scotland.

* * * *

German Trade in British Empire.

The Secretary of the British Empire Industrial League writes from London: " Previous to the outbreak of war the Council of this League decided to make a thorough inquiry into the causes of the rapid growth of German trade within our Empire. This investigation has been completed. " The root causes have everywhere throughout our Dominions proved to be the same—viz., the support given to Germans by British and British-Colonial wholesale and large retail merchants, the cheapness and showy finish of German productions, and the long credits which Germans grant to their customers. In the various branches of the textile and clothing trades the British public and our Colonies in the past have been grossly deluded in regard to the source and quality of the goods offered to them. This state of things will continue so long as every imported article is not certified and stamped so as to indicate its place of origin, in order that purchasers may know whether they are buying home-made or foreign productions. That many of our wholesale merchants are very indifferent in regard to the claims upon them of British and Colonial industries, or to the inroads of German competition, is clear from many of the reports that have reached us. Let

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it not be forgotten that commercial considerations played a very important rôle both in the causing of and method of waging the present war. Many eminent economists, previous to the outbreak, regarded the financial state of German industry as being extremely precarious and insecure. It has also been observed that in every manufacturing centre in Belgium, France and Poland, through which the German troops have passed, every factory within range of their artillery has been destroyed. That is not the result of accident or necessity, but part of a deliberately arranged plan intended to benefit the industries and trade of their Teutonic destroyers after the conclusion of peace. Germans will certainly return to the industrial attack on this Empire. They will re-attack under great difficulties, owing to the reduced level of their national and trading credit; but they will, nevertheless, try to force an entry by offering their productions at ridiculously low prices. The wholesale and retail tradesmen of Britain and the Colonies must be ready for a number of years to resist their seductive advances and support home industries. The public, by the practice of voluntary preference for our own home and colonial productions may be relied upon vigorously and heartily to second them."

Robinson.

The Robinson Gold Mining Company, in the quarter ended the 30th of September, made a working profit of £142,367, equal to 17s. 2d. per ton milled. The total working expenditure was £117,887, or 14s. 2d. and the revenue from gold £260,254.

Rose Deep.

At the Rose Deep, in the quarter ended the 30th of September, gold was won to the value of £208,655. The total working expenditure came to £144,651, or 16s. 8d. per ton milled, and the working profit was £64,004, or 7s. 5d. per ton.

Geldenhuis Deep.

A working profit of £35,843, equal to 4s. 11d. per ton milled, was made at the Geldenhuis Deep in the quarter ended the 30th of September. The total working expenditure was £163,262, or 22s. 7d. per ton, and the revenue from gold £199,105, or 27s. 6d. per ton.

INVESTORS' DIARY.

Dec. 30.—De Beers.

Witbank Colliery, Limited.

(Incorporated in the Transvaal).

NOTICE TO SHAREHOLDERS.

NOTICE is hereby given that the Fourteenth Ordinary General Meeting of Shareholders in the above-mentioned Company will be held in the Company's Board Room, Cullinan Building, Johannesburg, on FRIDAY, the 22nd JANUARY, 1915, at 11-0 a.m.

BUSINESS:

1.—To receive the Report of the Directors and the Financial Statements to the 31st August, 1914.
2.—To elect three Directors in the place of Messrs. C. S. Goldmann, H. J. King and J. Jeppe, who retire in terms of the Company's Articles of Association, but, being eligible, offer themselves for re-election.
3.—To appoint Auditors for the ensuing year, and to fix the remuneration for the past audit.
4.—To transact any other business which may be transacted at an Ordinary General Meeting, or which is brought under the consideration of the meeting by the Report of the Directors.

The London Transfer Registers of the Company will be closed from the 31st December, 1914, to the 2nd January, 1915, both days inclusive, and the Head Office Transfer Registers of the Company will be closed from the 18th January to the 5th February, 1915, both days inclusive.

By Order of the Board,

A. GREGOR,

Acting Secretary.

Johannesburg, 4th September, 1914. 41476

Stuttaford & Co.

For the year ended July 31, 1914, the profit on trading was £51,088. Adding £14,330 brought forward, there is £65,418. After providing for debenture interest and preference dividend, the directors recommend a final dividend on ordinary shares of 4 per cent. (making 7 per cent. for the year), payable December 15 to all shareholders registered December 1. After charging £675 for directors' fees and transferring £10,000 to general reserve fund (to be used in any way the directors may consider for the benefit of the company), there remains £19,486 to be carried forward. During the year the balance of the Capetown mortgage (£15,000) has been paid off. The net profit shown is arrived at prior to deduction of the income-tax instituted at the last ordinary session of Parliament. In accordance with the Act, after payment of the tax, directors propose deducting a pro rata amount from all dividends paid within the subsequent twelve months, in order that the tax may be borne equitably by both the preference and ordinary shareholders.

Safety-First Rules for the Electrician.

At the recent convention of the South-Western Electrical and Gas Association at Galveston, Texas, F. N. Lawton, manager, Wichita Falls Electric Company, stated that this company had prepared the following rules for men engaged in electrical work:—

SWITCHBOARD INSTRUCTIONS.

Safety First.—Remember your family and protect your fellow-workmen.

When operating the switchboard always stand on the rubber mat.

When throwing the switches, use but one hand.

When necessary, use rubber gloves, hanging upon the board.

Keep the board well lighted. Have oil lanterns always ready.

In case of fire open your exciter switches first, then use sand.

Report the slightest signs of trouble on the board.

Keep instruments and wiring all clean.

Use danger card when circuit is off for repairs or trouble.

Report all trouble on station log.

Watch temperature of oil in constant current regulator.

When working on back of board use wooden stool and rubber gloves.

LINEMAN INSTRUCTIONS.

Safety First.—Remember your family and protect your fellow workmen.

Learn the position of all circuits and wires upon the poles.

Use your rubber gloves in handling all wires. They may be alive.

Take the safest position on the pole.

Keep yourself free from grounds. Watch out for telephone cables and messenger wires.

In coming down a pole, watch out for street signs fastened to the pole.

In using tools on a pole, keep the groundmen away from the pole.

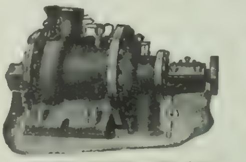
In making wire connections, use but one hand at a time. Don't get in circuit.

Constantly inspect lines for trouble. Keep all primaries clear.

Put away all tools at the end of the shift.

Keep your spurs, body-belt and all tools in good condition.—*Elec. Review and W. Electn.*

Specimen copies of the *South African Mining Journal* can be had from our Agents, The Argus Printing and Publishing Co., Ltd., Byron House, 82-85, Fleet Street, London, E.C.



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The Week's Company Meetings.

BREYTEN COLLIERIES.

Sound Position.

Steady Progress.

Company Free of Debt.

The fifth ordinary general meeting of shareholders of the Breyten Collieries, Ltd., was held last week in the board-room, Consolidated Goldfields Buildings. Mr. D. Christopherson presided, and there were present Messrs. F. Leslie Brown, J. E. Kent, E. Lewin, F. H. Tarlton, P. S. Wimble and A. C. Grant, representing 42,699 shares out of an issued capital of 90,000 shares.

The Chairman, in moving the adoption of the report and accounts, said:

Chairman's Speech.

In reviewing the report and accounts now before you, I will first deal with certain items in the balance sheet. On the debit side reserve account has been increased by £11,354, making a total of £40,354. This figure represents money which has been appropriated out of profits for capital expenditure over and above what was provided for by the issued capital and premium on shares. You will note the total of the three items of capital, premium on shares and reserve account amounting in all to £144,678, balances the cost of the property, together with the expenditure on equipment. At the end of the financial year the overdraft at our bankers stood at £3,581 as compared with £8,036 at the 31st of October, 1913, or a decrease of £4,455, but since the 31st of October, 1913, dividends amounting to £13,500 have been paid out. This overdraft at the 30th of November was further reduced to £828 1s. 10d. Sundry creditors, amounting to £14,188, represents mainly railage on coal for October, which has since been paid, provision for profits tax and income tax, native wages, etc.

On the credit side expenditure on equipment has been increased by some £7,000; this expenditure has been mostly incurred on improving and extending the surface plant and buildings, etc. Sundry debtors, amounting to £16,224, is almost entirely composed of amounts due by customers for coal supplied.

Shortage of Trucks.

Turning to the profit and loss account you will notice that a net profit of £23,554 was made. Generally speaking, it may be said that conditions prevailing during the period under review were not favourable to increase profits. During the year the stoppages to the plant amounted to 29.7 working days. These stoppages were mainly due to shortage of empty railway trucks at the colliery. It was hoped that an improvement would have been recorded in this respect for the past year, and there is every reason to think this would have been the case but for the difficulties the Railway Administration were faced with in January last, when a large number of railway employes went on strike, and again later in the financial year large additional calls were made on the rolling stock by the Government in connection with the war and the rebellion. In addition to the above, the management had to considerably add to the working costs in pushing on development in Nos. 2, 4, 5 and 6 adits owing to No. 1 adit becoming exhausted and No 4 adit being abandoned, as the area beyond the washout referred to in the engineer's report can be mined more economically through No. 3 adit. Lastly, under arrangements made with the Witwatersrand Native Labour Association native wages were increased, representing considerable additional expense, and at the same time there has been a decrease in efficiency of the native labourers, due to some extent to the fact that for a few months the work in the colliery was somewhat congested until more ground was opened up east of the dyke found running north and south in Nos. 2 and 3 adits. Thus I think it can be said that under the conditions prevailing during the last year the profits made can be considered fairly satisfactory.

Underground Position.

The underground position of the colliery may be briefly summed up as follows: No. 1 adit is exhausted, but at a future date it is to be expected that good coal will be found in advance of No. 1 adit area, which will be worked through other points of attack. No. 4 adit has been abandoned for reasons already given. Nos. 2 and 3 adits have intersected at several points the dyke running north and south, with the satisfactory indication of the presence of a large area of good clean coal of a favourable mining width. No. 5 adit is so far disappointing, but in view of the good coal found in the old river workings, there is reason to hope that improvement in the coal will be met with. No 6 is opening up a seam which in both value and width is as good as any yet opened up. Mr. Leslie states in his report that this adit will only open up a comparatively small area, but in addition to this, it is hoped it will open up a considerable extended area in No. 3 mine, which will greatly strengthen the underground position. It is satisfactory to note from Mr. Leslie's report that in his opinion "there is now more coal in sight than at any time in the previous history of the collieries." The immediate policy of your board as regards development is to continue Nos. 5 and 6 adits, and, should the small prospecting shaft which is being put down in the large central area situated south of the present workings indicate the presence of a good seam, to open up that area by easy stages. You will have seen that your directors have declared an interim dividend of 2½ per cent. for the six months ended the 31st December. In doing so, the policy, as outlined last year, of paying larger dividends and spreading the repayment of borrowed money over a longer period has been abandoned. You directors feel that, whilst such a policy was quite sound in peace times, the position was different under present conditions, and they considered it sounder to reverse the policy and to free the company of debt as soon as possible. This will be the case at the 31st of December, after allowing for a 2½ per cent. dividend, provided normal profits are made this month.

The Native Difficulty.

Undoubtedly our profits have been affected not only through the increase of natives wages and other favourable and more costly changes in the compound, both of which steps were taken with a view to popularise collieries with natives (the native, as a rule, preferring to work in gold mines, where he is in a more thickly-populated district and has certain opportunities which he has not on an outlying colliery); but profits latterly would have been still more affected had not the gold mining companies with whom we have contracts when we placed the position before them, in view of the low price they were being supplied with coal by us, readily met us and assisted us in taking what they considered a reasonable step to popularise collieries amongst natives, by agreeing to pay an extra 3d. per ton, and our thanks are due to those gold mining companies for this kindly consideration. After much care and trouble the company can now be said to be free of debt and in a sound position underground, but our contract prices for supplying coal are low, and any additional increase in costs naturally affects us more than where collieries are getting better prices. Our thanks are due to Mr. Lewis for the strenuous work he has put in from the very start of the colliery, and we hope that during the coming year he will have fewer difficulties to meet than last year, during which period he has undoubtedly been handicapped in this respect. I now beg formally to move the adoption of the report and accounts.

The report and accounts were adopted. Messrs. Douglas, Louw and Co. and Frank A. Stokes were re-appointed auditors.

THE SOUTH AFRICAN
Mining Journal,
WITH WHICH IS INCORPORATED
South African Mines, Commerce and Industries.
ESTABLISHED 1891.

VOL. XXIV., PART I.] JANUARY 2, 1915. [No. 1214.

HEAD OFFICE: 176-180, Stock Exchange Buildings, Fox Street (2nd Floor), Johannesburg, Union of South Africa.

Telephone **913.** P.O. Boxes **963** and **418.**

Cable and Telegraphic Address: "**MINING JOURNAL.**"

AGENTS FOR GREAT BRITAIN: Argus Printing and Publishing Co., Ltd., Byron House, 82-85, Fleet Street, London, E.C.

AMERICA: Advertisements accepted from any recognised Advertisement Agency.

ANNUAL SUBSCRIPTION RATES: Oversea, £2; South Africa (by post), £1 10s.; Local Delivery (Town only), £1 6s.

Copies of this journal are obtainable at all Branches and Agencies of the Central News Agency, Ltd., at all News Agents and Railway Bookstalls throughout South Africa, and at the London Agency as above.

NOTICE.—The postage of this issue of the *S.A. Mining Journal* is: South Africa, 1d. All other parts, 1½d.

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Notes and News.

Modder Deep.

A correspondent who writes for information regarding the Modder Deep, states that "almost every other" person on the Rand is a shareholder in the company. If that be so, the Rand is very fortunate, as the reduction works at the property have now got into their stride, and are running quite smoothly. At the outset, of course, the usual adjustments and minor alterations were found necessary, but these were quickly made, and the initial output declaration will be made, as anticipated, for January.

* * * *

The Position of the Nigel.

According to the quarterly report of the Nigel for the three months ended September, the results were unsatisfactory, the only points attacked which gave payable values being the 22nd and 23rd levels east of No. 3 shaft and the 11th level south of No. 12 shaft. Owing to the continued absence of rain 20 stamps were hung up towards the end of August, but 10 were re-dropped in October, since when 65 have been running. "The position regarding water is again very serious; no rain of any consequence has yet fallen in the Nigel district, and unless we get rain by the end of the current month we fear the battery will have to be closed down. War and rebellion: The Government of the Union of South Africa have commandeered 33 of the mine employees for active service, also some horses, mules, wagons and carts. This naturally disorganises operations and will materially affect returns. The Board regret that owing to the gravity of the situation in South Africa the payment of an interim dividend is not contemplated."

* * * *

Advance in Tin and Copper Prices.

The change which has lately come over the copper and tin markets is received by the metal trades with much satisfaction, writes a Birmingham correspondent. The advances which are being registered in quotations are very gratifying, and show that an improvement in the circumstances surrounding the iron market cannot be long delayed. Indeed, the recovery in the pig iron market has already commenced. Copper prices have risen 10 per cent in two weeks and have now got to within £4 or £5 per ton of the prices which prevailed before the outbreak of war Compared with a month ago best selected copper has advanced £6 to £6 10s. and ingots £7 5s. to £7 15s. per ton both descriptions being this week quoted £59 15s. to £60 5s per ton, while standard copper, three months and cash alike, is quoted £51 5s. to £51 12s. 6d. per ton. The improvement is due largely to strong American cables, and prices are now also creeping up in America. An extension of the speculative element is almost certain to be seen in copper circles within the next few weeks. Tin is advancing even faster than copper, and the whole of the fall which has taken place since the war commenced has been recovered. Confidence has now to all appearances been re-established in this metal, and it is widely thought that the improvement will be continued. On the month ingots have gained £10 per ton, and Straits £12 to £12 10s., the former being quoted this week at £146 to £148 and the latter at £150 nominal, while eastern sales are taking place at £142 10s. to £143 10s.

* * * *

Vaal River Goldfields.

A suggestion is made to reconstruct this company, with a capital of £183,500 in 2s. shares, the new shares to carry a liability of 3d. per share. In the event of the whole amount offered being subscribed, there would be a cash working capital of £22,500. As from this would have to be provided accumulated debenture interest, registration expenses, and underwriting commission, etc., the balance would not be sufficient to put the company on a good working footing, and a further appeal for funds would be necessary. The property is not yet proved, and an entirely independent report should be put before the shareholders before they are asked to subscribe more money.

No Dividend by De Beers.

The following announcement has been issued by De Beers Consolidated Mines:—"The board of directors beg to announce that, owing to the depressed condition of the diamond market, and the consequent cessation of the company's mining operations, they do not feel justified in declaring a dividend on either preference or deferred shares this half year."

* * * *

Piggs Peak Development.

The report of the directors of the Piggs Peak Development Co., Ltd., for the year ended March 31, states that operations have resulted in a balance of profit of £10,063, which, together with the balance brought in from last year, it is proposed to carry forward. Maintenance and upkeep have been debited to working costs, and £6,000 has been written off from machinery account. Debentures to the value of £5,100 were redeemed, leaving the debenture issue at £15,625. Working results for the twelve months ended March 31 last were less satisfactory than those shown in the preceding report, as will be clear from the annexed comparison:—

	1914.	1913.
Tons milled	31,700	32,330
Average value, dwts. ...	8·01	8·91
Yield per ton . .	31/3	34/-
Total Costs per ton . .	25/11	25/9
Mine revenue	£49,534	£54,976
Sundry revenue	£1,529	£820
Net profit	£10,063	£11,248

Mr. J. P. Ward estimates the ore reserves as at March 31 last as follows: Old section, fully developed ore, 58,490 tons of 5·8 dwts.; new section, fully developed ore, 5,273 tons of 13·7 dwts.; new section, partially developed ore, 7,665 tons of 14·3 dwts.; combined total, partially and fully developed ore, 71,428 tons of 7·2 dwts. The upper levels, both in the old and new section mine, continue to yield additional supplies of ore as stoping proceeds. A winze has been sunk from the 6th level in the old section mine to a depth of 200 ft. The work done has shown that the ore body is likely to be found further to the west than originally estimated, and exploration work at present is being carried on in this direction. In the new section mine further development in depth is proceeding. The effect of the war has been felt in an increase in the cost of most supplies; otherwise work is proceeding as usual.

* * * *

German Interests in the Congo.

It may not generally be known that there are considerable German interests in the Congo Free State. In 1912 prospecting rights were granted to a purely German group and a French group. The former was formed under the auspices of the Brussels branch of the Deutsche Bank and the latter under the lead of the Comptoir National d'Escompte of Paris, the Societe Generale, and the firm of Benard and Jarilowsky. According to the official report of the Comite Speciel, the German undertaking did not claim any mineral fields or ask for any prospecting licences, although the general prospecting right and the right of laying claim to mineral fields expired on December 15, 1914. The Belgian prospecting companies, in which German capital is frequently interested to the extent of one-half, have made a number of promising finds, and have secured claims to large fields. Thus the Societe Miniere Congolaise, which was constituted by the Dresden Bank and the Nagelsmackers Bank, has obtained about 192,000 acres at Ruwe and 100,000 acres at Mutendele, and the Societe Industrielle et Miniere du Katanga, in which the Disconto Gesellschaft is interested, has secured five blocks of land, of a total of nearly 500,000 acres. The last-mentioned company took over the mining rights of the Societe Belgo-Katanga, and reconstituted itself under the title of the Societe Belge Industrielle et Miniere du Katanga. It is this particular company which discovered the diamond pipes on the Kundelungu Plateau, so that German capital, through the Disconto Gesellschaft, is also concerned with the finds of diamonds in the Congo. In addition, the Societe Anversoise pour la Recherche des Mines au Katanga, in which the Frankfort Metal Company is interested, obtained claims on six fields of 370,000 acres. The great activity in prospecting for minerals is shown by the fact that of 360 special licences granted recently, seventy six were for copper, thirty three for copper and iron, and the remainder for iron and manganese, gold, silver, platinum, tin, coal, and petroleum, diamonds, cobalt and nickel, lead and salt.

* * * *

Welgedacht Exploration.

The report of the Welgedacht Exploration Company, Ltd., for the year ended 30th June, 1914, submitted at the meeting on the 24th inst., states that the net result of the year's working is a profit of £6,470, which, added to £5,562 brought forward, gives a total of £12,041 to the credit of profit and loss account. The liquid assets at 30th June, 1914, amounted to £45,485, mostly on short loan in London earning a satisfactory rate of interest. The directors have decided to recommend a dividend of 1s. per share. They trust that this decision will be approved by shareholders in the present time of stress, but state that it should not be assumed that regular dividends can hereafter be paid from the coal area alone.

* * * *

Lark Syndicate Claims.

In the House of Commons in mail week Mr. Fred Hall (U., Dulwich) asked the President of the Board of Trade if he was aware that the Central Mining and Investment Corporation, Ltd., had acquired certain mining claims known as the Lark Syndicate, the possession of which had been the subject of litigation in the South African Courts, and that the result of that litigation had been to throw doubt upon the legality of the Central Company's ownership in the property, and if, as the company was registered in Great Britain, he would take steps to ascertain whether the facts were such as to justify some action being taken against those responsible for the direction of the Central Company. Mr. Runciman said the only information in the possession of the Board of Trade with regard to the subject referred to by the hon. member is contained in letters which they received last June from a gentleman who considers that he is entitled to possession of certain mining claims in South Africa. Any dispute on this subject can only be maintained by the Courts, and the Board of Trade cannot intervene in the matter. Apparently, this question put to the President of the Board of Trade in connection with the ownership of the Lark Syndicate claims is an echo of the case that was heard in the Transvaal Courts in 1913, when the Federation Co. instituted an action against the titles of the City Deep. When the case went into Court the Federation Co. was not even represented. The absolute validity of the City Deep mining titles, said the chairman at the annual meeting, "which are all protected by bezitrecht, was confirmed, and the point that bezitrecht constitutes an unassailable title under the Gold Law, unless obtained by fraud which was not even alleged in the present case—was upheld. In respect of our freehold title on the Farm Doornfontein absolution from the instance was given, and not final judgment, as certain witnesses were not available. The Federation Co. were ordered to pay all costs on all points." The latter venture afterwards went into liquidation.

* * * *

Mines and War.

It is expected that Russia will now concentrate her attacks upon those parts of Silesia and Galicia adjacent to the "Dreikaiserliche Ecke," where Germany, Austria and Russia join, for there are some great mines of coal, zinc, lead and iron, of which the Russians are probably in great need. Their own zinc mines of Olkusz and their important coal mines of the Dombrowa basin lie in this district, as do also their zinc smelteries at Bendzin and Dombrowa, which are the only producers of spelter in the empire. This district has been in German or Austrian hands ever since the beginning of the war, and Russia has been obliged to obtain her spelter from foreign countries. Her deprivation of the Dombrowa coal mines has also been troublesome, the Donetz region being her only other source of supply, and it has been apparently insufficient. Anyway, the European papers have been reporting a serious scarcity of coal in Russia and poor chances of getting large quantities from England in the present condition of navigation. Now, however, the Russian advance has reached this corner of Poland, and Russia is in a position to strike for the recovery of her own mines, if she has not already done so. A few miles further west she can seize, if she be strong enough, the great zinc, lead, coal and iron mines of Silesia, the zinc smelteries around Beuthen and Kattowitz, the lead smelteries at Rosdzin and Tarnowitz, and the iron and steel works at Königshütte, sulphuric-acid works, sheet-zinc rolling mills and many other kinds of useful factories. If successful, she will have all the zinc and lead she needs and will no longer have to buy them in New York. She will get coal, which is even more important; and with her own supply of copper and petroleum, will be in a comfortable position with regard to metals and minerals. Therefore, a violent attack in this direction is to be anticipated. Other important mines of this region are the famous salt mines of Wieliezka and Bochnia, a few miles east of Cracow, in Galicia. The important petroleum fields of Galicia, which are near Drohobycz, have been in Russian possession for some time back.

* * * *

Alcohol and Mining.

At the last election in the U.S.A. two important mining states, viz., Arizona and Colorado, went "dry," *i.e.*, became prohibitionist states. This was no great ground for surprise, the incompatibility of whisky with efficient work in mining having long been recognised. According to the *Engineering and Mining Journal*, mine operators in Arizona, Colorado and Montana have lately been emphatic in deploring the evil tendency of the saloon upon the economics of the industry, especially in decreasing working efficiency. The direct waste of resources, the absence of thrift and the high cost of policing are further results to the community that may be traced to alcohol in a more or less degree, chiefly more. Mr. John V. N. Dorr, a distinguished mining and metallurgical engineer, has furnished, in a letter to the *Evening Post*, some concrete evidence as to how this question is now regarded in Colorado, quoting from a communication received from a large machinery house in Denver as follows:—

> It was indeed remarkable to find how strong the various coal mining companies were in favour of prohibition after having had a year of it under the federal authorities, who enforced the laws and made the coal-mining camps absolutely dry. It was reported a couple of weeks ago that the Colorado Fuel and Iron Company had announced to its employees that it was in favour of having the State go dry, and we have talked to a great many operators who called at our office, and, one and all, they have agreed that the men were doing about 15 per cent. better work per dollar of wages paid to them and that their families were in much better condition than when liquor was sold. On election day and the day before it, the coal companies had a great many of their men out on the street talking prohibition, and I don't think I ever heard a better argument down the line in favour of it, simply on account of the better work that surrounded them.

* * * *

The Demand for Molybdenite.

According to a Sydney exchange, there is said to be a good demand for molybdenite overseas, statements to the contrary notwithstanding. Several parcels have been despatched from Sydney to London since the outbreak of the war. Under existing conditions it is, of course, essential that shippers should supply the Customs authorities with the fullest of particulars. Otherwise, shipment will not be permitted. It is generally understood that the Imperial Government is the buyer. Being desirous of knowing what the outlook was for the molybdenite and wolfram markets during 1915, the manager of the ore department, Dalgety & Co., Sydney, recently addressed a query on the subject to the firm's London representative. He received the following reply:—"Molybdenite: Expect good demand to continue. Wolfram: Impossible to forecast. Future depends upon shipments from other countries; but fair demand seems certain, as English manufacturers now intend making tungsten metals.

TOPICS OF THE WEEK.

NEW TAXATION PROSPECTS.

Since the reference in our last issue to the possibility of new taxation, the daily papers have awakened to the importance of the question, and Pretoria correspondents have haunted the purlieus of the Ministerial offices to glean tidings of the intentions of the Government. The idea of a land tax is, in the circumstances, scouted, and doubtless any scribe who attempted now to emphasise the equity of such an impost would be generally condemned for embarrassing the Government at this inopportune juncture. Instead, we are promised an increased income tax, higher railway rates, and even heavier direct taxation on mines. Of these proposals, the only one that can be defended is the increase of the income tax, and that only if coupled with a proviso that incomes at the coast should be taxed equally with those on the Rand, the relative purchasing power of both being taken into account. The principle of increasing railway rates is more open to criticism, and will doubtless be vigorously combatted by the inland commercial community and by all thinking inland consumers. Manifestly taxation through railway rates puts an unfair share of the burden on the inland centres, and further weighs the scales in favour of the dweller at the coast. Some more equitable means of distributing the new burden will have to be devised by the Treasury. Least palatable of all is the talk of increasing the direct taxation of the mining industry. The country is full of amateur economists who if given their way would tax mining to death, and one correspondent quotes Rhodes as testifying to the greater ability of mining to stand further imposts than any other branch of productive activity. To our mind the quotation from Rhodes is more favourable to the opponents of further mining taxation than otherwise. He said: "I have made a great study of the mining question and have statistics, not only on Great Britain and Africa, but of the world, carefully compiled, relative to this proposition, so that I might not be in error. My investigation further shows that farming is more risky than mining; that 29 per cent. more people lose money and fail in the mercantile business than in mining, and that 11 per cent. more lose money in the manufacturing business than in mining; and 17 per cent. more men lose money in any other business than in mining. Mining is the backbone of wealth and the spinal column of all certainty. I believe that investment in good mining stock is the most profitable investment and very much the safest; and is the safest because your security is the ore itself." Because mining is the "spinal column" of all certainty is surely just the very reason why it should not be taxed out of existence. As an American contemporary opportunely points out, there is no industry which has less need of the benefits of state government than mining; the mining industry has nearly always preceded the formation of full-fledged states. In the old days mining men organised mining districts for their own uses and adopted the few rude ordinances governing their property rights and the conduct of the individuals. The modern state followed when the agricultural and merchant class trod upon the miner's heels. It is not that the mining industry abhors civic institutions or that it objects to the support of state and provincial governments; its grievance arises when the agricultural and merchant classes, by reason of superior numerical population, over-ride the traditional interests of the mining man and seek to benefit themselves at his expense. It is not just to view the mining man as a tax dodger because he demands a rate of taxation which will permit of his enduring, especially since it is the mining industry which has blazed the way for the farmer and merchant and real estate speculator, and which is still the mainstay of national prosperity. It is only as we contemplate this truth that we are able to understand the position of the mining man upon the subject of taxation. If new and increased taxation has temporarily to be levied to meet the extraordinary expenditure of the time, every care must be exercised lest it operate permanently to stifle enterprise and scare away capital.

DE BEERS AND THE THE DIAMOND OUTLOOK.

His speech this year was naturally much briefer than usual, Mr. Francis Oats, the Chairman of De Beers, covered all the important outstanding questions affecting the diamond industry at the annual meeting held at Kimberley this week. His remarks in regard to these questions may be segregated as follows:—(1) The closing down of De Beers as it affects employees; (2) the recent diamond conference; (3) the German S.W. African fields; and (4) the position and prospects of the diamond market and its effect on De Beers. In regard to (1) Mr. Oats was able to show that the company had acted generously and liberally. The decision to close down had naturally involved the question of the employees. The company found it difficult at the outbreak of the war to obtain money to carry on. Mr. Oats recalled the fact that they had been charged with callousness and with indifference to the wants, desires, and needs of their people. He said they repudiated that charge, and declared that they did all that was possible to meet the situation. Out of 2,700 European men employed by the company they had assisted 699 to go elsewhere to find employment. Hardly any of these men went away without some consideration from the directors. These men cost the company about £23,500, or about £40 per man, who went away. A large number of men had gone to the front, and these were receiving from the company the difference between military pay and their company half-pay, which absorbed a sum of £7,000 a month. This would be a charge on the company whilst these men were on active service. There were 959 men left on the works, for whom arrangements were made for their retention until the end of January, after which date it would seem that De Beers will be unable to retain them. In regard to (2) the much-discussed recent diamond conference, Mr. Oats showed that the outbreak of the war had negatived the work of that gathering and that the board of De Beers had not even deemed it necessary to consider its recommendations. Mr. George Hay's criticism on the point, therefore, appears to have fallen flat. Interest naturally attached to what Mr. Oats had to say in regard to (3) the German South West African diamond fields. He admitted that De Beers had participated in the purchase of the product of the German South-West diamond fields, as there was no doubt that the latter were affecting the price of De Beers diamonds. They did not know then, of course, that war was going to take place. He believed Germany benefited to the extent of a million annually from the diamond industry in German South-West Africa, and after the war he hoped the Union Government would take the place of the German Government and benefit to the same extent. On the most important question of all (4) the position of the diamond market and its effect on the company, Mr. Oats spoke very clearly and frankly. He showed that in the year under review, the sale of diamonds had been considerably less in quantity, and the price had been somewhat lower. The result was that profits were less than in the year before. He admitted that they might have been able to pay a dividend, but they had no knowledge or foresight of what was ahead. Proceeding, he said they were now passing through the greatest crisis the world had ever known, and of course the sale of diamonds, which were a luxury, was stopped. The product of De Beers was a luxury which did not find a ready sale in these times, and they were perforce obliged to mark time. They had faith that in the course of time things would right themselves. In the meantime the question arose should they still produce? The effect of that would be more speedily to denude the company of their resources. They had therefore decided to husband their resources. In regard to the future he said they felt there was little or no hope of resuming mining operations in the ordinary course for a long time to come as they had large stocks of diamonds and blue ground on hand. He was not going to prophecy the duration of the war. It was uncertain, and for that reason it was necessary they should be careful and husband their resources. The war, he thought, would be followed by a period of depression, but they had faith that following the success of the Allies and the removal of the menace to the world's peace there would be a revival in the diamond trade, and that with less spent on armaments there would be more money for industrial development. And in thus contenting himself with the expression of pious hopes, and refusing to be drawn into prophecy, Mr. Oats was, in the circumstances, plainly following the dictates of prudence and wisdom.

A BADGE OF INDUSTRY.

Despite the very plain acknowledgement by the Union Government to the value and the importance of the service being rendered to the Empire by the workers of the Rand in "carrying on," the desire is still manifest among many along the Reef to be with their comrades in the field. In this connection it is noteworthy that in England there is a growing demand for some form of badge that may be worn in order to indicate that the wearer is serving his country in this critical time just as much as the man in uniform. That this is the view of those at the head of the Admiralty and War Offices is shown by the official letters that have been sent to all firms and companies engaged on the production of materials for those departments. Thus, from the War Office, Lord Kitchener has sent out a letter, in which he says:—"I wish you to impress upon those employed by your firm the importance of the Government work upon which they are engaged. I fully appreciate the efforts which the employees are making and the quality of the work turned out, and I trust that everything will be done to assist the military authorities by pushing on all orders as rapidly as possible. I should like all engaged by your firm to know that it is fully recognised that they, in carrying out the work of providing the Army with supplies and equipment, are doing their duty for the King and Country equally with those who have joined the Army for active service in the field." On behalf of the Navy, also, Mr Churchill, in the House of Commons the other day, stated that "the Admiralty had been aided by the energy and determination of the workmen, who had strained their strength to the utmost, and who had by so doing made themselves the comrades of their fellow citizens who were fighting in the trenches." It is said that in some departments of the iron and steel, engineering and other industries which are of first importance to the nation at the present time, there is already a marked scarcity of skilled labour. In order to meet the wishes of their employees, so that they may be in a position to produce evidence to rebut any taunts as to their non-enlistment, quite a number of firms connected with the engineering industries in England have gone to the extent of issuing cards bearing on the back a copy of Lord Kitchener's letter, and, on the front, a reproduction in colours of the British flag, the name of the firm, and the words: "Mr. —— is serving his country by using his best endeavours and work in connection with the manufacture of —— for the British Government." While such cards are useful to a certain degree, they only partially meet the requirements of the case, and in England it is suggested that the Government should undertake the issue of an official badge which workmen employed on the production of material for the Government can wear on their coats or caps, and so give an outward sign to the general public that, although not wearing khaki, they are none the less serving their country. So great is the need of such outward sign of public service felt in many parts of England, that several firms connected with the motor and aviation industries, have, in addition to cards of the kind alluded to above, issued badges to their employees on the lines suggested. In Newcastle, it appears, something like 30,000 men employed in factories are wearing such badges with the permission of the War Office. The idea might advantageously be extended to the Rand.

TRANSVAAL GOLD MINING COMPANIES DIVIDENDS FOR 1914.

Complete Table of Distributions for the Year.

The following is our usual table of dividends of Transvaal gold mining companies for 1914:—

Company.	Date.	No. of Dividend.	Rate %	Capital. £	Amount. £	Total Rate % for 1914.	Total Rate % for 1913.
Bantjes	June	5	2½	502,306	12,557		
	Dec.	6	2½		12,557	5	7½
Brakpan Mines	June	5	12½	750,000	93,750		
	Dec.	6	17½		131,250	30	32½
City Deep	June	4	11¼	1,250,000	140,625		
	Dec.	5	12½		156,250	23¾	17½
City and Suburban	June	29	7½	1,360,000	102,000		
	Dec.	30	7½		102,000	15	15
Consolidated Langlaagte	June	2	10	950,000	95,000		
	Dec.	3	10		95,000	20	10
Consolidated Main Reef	June	12	5	924,364	46,218		
	Dec.	13	6¼		57,772	11¼	10
Crown Mines	June	26	55	940,106	517,058		
	Dec.	27	30		282,032	85	110
Durban Roodepoort	May	80	10	125,000	12.500		
	Nov.	81	15		18,750	25	25
Durban Roodepoort Deep	June	9	3¾	440,000	16,500		
	Dec.	10	3¾		16,500	7½	5
East Rand Proprietary Mines ...	June	18	7½	2,415,897	183,442		
	Dec.	19	10		244,590	17½	25
Ferreira Deep	Mar.	22	25	980,000	245,000		
	Sept.	23	25		245,000		
	Dec.	24	25		245,000	75	50
Geldenhuis Deep	June	29	8¾	585,753	51,253		
	Dec.	30	10		58,575	18¾	17½
Geduld Proprietary	Dec.	1	5	922,500	16,125	5	
Ginsberg	June	22	10	210,000	21,000		
	Dec.	23	7½		15,570	17½	35
Glencairn	Dec.	17	5	550,000	27,500	5	5
Jumpers (liquidation)	Sept.	—	6¼	100,000	6,250	6¼	
Knights Deep	June	18	5	743,526	37,176		
	Dec.	19	5		37,176	10	17½
Langlaagte Estate	June	48	5	886,500	44,325		
	Dec.	49	5		44,325	10	10
May Consolidated		—	–	288,750	—	—	10
Meyer and Charlton	June	49	35	200,000	70,000		
	Dec.	50	35		70,000	70	70
Modder B.	June	4	25	700,000	175,000		
	Dec.	5	30		210,000	55	45
New Heriot	May	40	30	115,000	34,500		
	Nov.	41	35		40,250	65	70
New Kleinfontein	June	19	5	1,151,540	57,577		
	Dec.	20	5		57,577	10	7½
New Modderfontein	June	16	15	1,400,000	210,000		
	Dec.	17	15		210,000	30	30
New Primrose	June	42	20	325,000	65,000		
	Dec.	43	20		65,000	40	60
New Rietfontein	Dec.	14	2½	610,084	15,252	2½	2½
New Unified	June	12	10	250,000	25,000		
	Dec.	13	10		25,000	20	20
Nourse Mines	June	20	8¾	827,821	72,434		
	Dec.	21	8¾		72,434	17½	28½
Randfontein Central	Dec.						10
Robinson	June	44	9	2,750,000	247,500		
			10*		275,000		
	Dec.	45	9		247,500	28	15
Robinson Deep	June	23	12½	1,000,000	125,000		
	Dec.	24	10		100,000	22½	27½
Rose Deep	June	26	20	700,000	140,000		
	Dec.	27	15		105,000	35	42½
Simmer and Jack	June	24	5	3,000,000	150,000		
	Dec.	25	5		150,000	10	13¼
Van Ryn	June	21	22½	500,000	112,500		
	Dec.	22	22½		112,500	45	47½
Van Ryn Deep	June	2	12½	1,196,892	149,612		
	Dec.	3	12½		149,612	25	7½
Village Deep	June	12	10	1,060,671	106,067		
	Dec.	13	11¼		119,325	21¼	15
Village Main Reef	June	27	35	472,000	165,200		
	Dec.	28	35		165,200	70	70

* Bonus.

Company.	Date.	No. of Dividend.	Rate %	Capital. £	Amount. £	Total Rate % for 1914.	Total Rate % for 1913.
Witwatersrand	June	20	25	469,625	117,406		
	Dec.	21	25		117,406	50	50
Wit. Deep	June	17	15	550,000	82,500		
	Dec.	18	17½		96,250	32½	35
Wolhuter	April	13	6¼	860,000	53,750		
	Oct.	14	6¼		53,750	12½	10
York G. M. Syndicate	June	—	7½	37,000	2,775	7½	30
Ceylon Lydenburg	Dec.	4	10	22,600	2,260	10	27½
Fairview (T.C.L.)	Dec.	1	8¾	45,000	3,937	8¾	—
Glynn's Lydenburg	Jan.	25	10	170,000	17,000		
	July	26	10		17,000	20	20
Nigel	Dec.	36	7½	223,106	16,733	7½	15
Piggs Peak (Swaziland)	Dec.	1	2½	223,225	5,580	2½	—
Sheba	Feb.		5	269,738	13,487		
	June		5		13,487		
	Dec.		5		13,487	15	17½
Sub Nigel	June	4	2½	431,580	10,790		
	Dec.	5	2½		10,790	5	5
Transvaal G.M. Estate	Mar.	16	17½	604,225	105,739		
	Sept.	17	17½		105,739	35	40
Worcester Exploration	–	—	—	—	—	—	7½

COAL, BASE METAL, AND DIAMOND DIVIDENDS IN 1914.

Company.	Date.	No. of Dividend	Rate %	Capital. £	Amount. £	Total Rate % for 1914.	Total Rate % for 1913.
COLLIERIES—							
Apex	Dec.	17	7½	300,000	22,500	7½	—
Anglo-French Nav. (Pref.)	—	—	12¾	120,000	15,300	12¾	16¼
Breyten	July	3	5	90,000	4,500		
	Dec.	4	2½		2,250	7½	10
Cassel	—	—	—	200,000	—	—	5
Clydesdale Coll.	June	14	5	185,000	9,250	5	5
Coronation Coll.	June	6	5	83,000	4,150	5	10
Douglas			5	175,000	8,750	5	5
East Rand Gold and Coal	Dec.	5	5	50,000	2,500	5	5
Middelburg Steam (Pref.)			5	64,900	3,245	5	5
,, (Ord.)				94,440			7½
Transvaal Coal Trust	June	29	7½	545,760	40,932		
	Dec.	30	8¾		47,754	16¼	17½
Transvaal and D.B. Investment ...	Nov.		17½	185,000	32,375	17½	17½
Tweefontein Coll.	—	—	—	60,000			25
Witbank	Feb.	18	12½	210,000	26,250		
	Sept.	19	12½		26,250	25	25
Welgedacht	Dec.	1	10	156,750	15,675	—	—
BASE METAL MINES—							
Rooiberg	June	7	7½	180,000	13,500		
	Dec.	8	5		9,000	12½	30
Swaziland Tin	—	—	—	82,000	—	—	25
Zaaiplaats	Jan.	14	25	60,000	15,000		
	April	15	20		12,000	45	70
DIAMOND COMPANIES—							
Premier (Def.)	June	12	200	40,000	80,000	200	750
Premier (Pref.)	April	19	125	40,000		125	250

Re-opening of London Stock Exchange.

It is officially announced in London that the Stock Exchange will re-open on the 4th of January. The London Stock Exchange officially announces that members and clerks who were formerly citizens of enemy countries are required to re-exhibit their letters of naturalisation, and will, further, be required to satisfy the committee they have been denationalised in the country of their origin. According to Reuter, restrictions in connection with the re-opening of the London Stock Exchange provide that minimum prices shall remain in force till the end of January, but subject to official revision. No one shall bargain in shares dealt in in the American market at less prices than the English equivalent of the New York closing prices on July 30. It is provided that the Stock Exchange Committee may fix a minimum price for any security, and will also, prior to re-opening, fix minimum prices for foreign Government and other securities dealt in with foreign Bourses. Only dealing for cash will be permitted, and every bargain must be officially recorded. Arbitrage business is prohibited. Members will not be allowed to bid openly in the market. Each broker must make a declaration in writing, and must be fully satisfied that any order will not benefit alien enemies.

THE YEAR WITH THE SHEBA.

Profit, £49,549—Ore Reserves, 101,500 Tons—Encouraging Prospecting Results.

For the year ended June 30, 1914, the net result of operations at the Sheba, after deducting all charges at the mine, etc., shows a profit of £49,549, to which has been added £11,489 brought forward, making £61,039, which has been appropriated in the following manner: Dividend No. 8 (5 per cent.), £13,486; dividend No. 9 (5 per cent.), £13,486; dividend No. 10 (5 per cent.), £13,486; income tax and Transvaal profits tax, £6,109; amounts written off plant and machinery, etc., £3,335; one-half share of loss incurred during the year in connection Rosetta property, £592; amount written off one-half interest in the Rosetta property, £1,176; carried forward, £9,364. The whole expenditure during the year on mine development, amounting to £22,435, has been charged against the revenue. The working costs (exclusive of expenditure on mine development), calculated on the tonnage milled, namely, 74,965 tons, amounted to £1 3s. 5·92d. per ton, a decrease of 1·51d. per ton. The cash resources of the company (exclusive of stores and live stock, £7,294; shares in other companies, £1,274; payments made in advance, etc., £850; in all, £9,418) at the close of the financial year were: Deposits, plus interest accrued, £29,610; at bankers and in hand (London and South Africa), £3,120; gold in transit, £17,880; sundry debtors, £1,554; total, £52,166; current liabilities, Transvaal profits tax, income tax, bills payable, and dividends unpaid, including dividend No. 10), £39,514; balance, £12,651. In all, the capital expenditure amounted to £15,145. During the year 74,965 tons of ore of an average assay value of 13·1 dwts. fine gold per ton were mined and treated; the total extraction was 80·50 per cent. and the yield of gold amounted to 28,932 fine ozs., an increase of 1,014 ozs. The ore reserves at the close of the year were estimated at 101,500 tons. A first dividend of 5 per cent. on account of the current financial year has been declared and will be payable on January 2, 1915. Valley Prospecting Syndicate: This prospecting venture, in which the company holds 500 shares of £1 each fully paid, one-half of the issued share capital, was formed to prospect an area of about 1,000 claims situated two miles east of the Sheba and Zwartzkopje. The result of work so far inclines to show that the encouraging surface indications continue but a short distance below the surface. The annual meeting was held in London on December 9th.

German Shortage of Copper.

One of the achievements of the Allies which is going to contribute materially towards the shortening of the war is the cutting off of Germany's external supplies of copper. The red metal is not only an essential article in many important industries, but is indispensable in the manufacture of ammunition, and without it the enemy must sooner or later find himself not merely seriously inconvenienced, but hopelessly crippled. It is true he has in the Maresfeld Mines certain internal resources, but they are not adequate to meet his enormous requirements. Thus, he discovers his ordinary commercial needs already starved in order that armament demands may be fed, and even they have to put up with short commons. That the strain is, even at this comparatively early stage, getting acute is sufficiently proved by the willingness of Germany to pay double the market price of copper. But the metal is, of course, treated as contraband of war by the Allies, and we have even held up ships conveying cargoes between neutral countries when it was likely their contents would reach the enemy. Germany used to be the largest customer of the United States, and the sudden stoppage of the great bulk of exports from that country to Europe has entailed considerable hardships on producers in America. The effect of this embargo on copper for German, according to the *Financial Times*, benefits the Allies in several ways. It not only helps to shorten the duration of hostilities, but it ensures that supplies of the metal will be ample and that the price will not rise to an unreasonable level.

GERMAN SOUTH-WEST AFRICA.

Spencer Bay, showing Typical Diamondiferous Sands.

THE S.W. TRANSVAAL DIAMOND OUTPUT.

Returns for October and November.

October. Owing doubtless to the troubled state of the country, no returns for the month of October were forthcoming at the customary date, but the figures for two months are now available. From these it is gathered that in the month of October the various alluvial diamond diggings throughout the South-Western Transvaal produced a total output of 2,057 carats of a value of £5,388 19s. 6d. At the Bloemhof diggings a diamond of 24½ carats, value £110, was found; at Kameelkuil one of 12¼ carats, value £75; and at London one of 11½ carats, value £86 5s. Details of the returns are as follows: Bloemhof, 521¾ carats—£993 9s.; Kameelkuil, 217½—£890; London, 332½—£843 4s. 6d.; Christiana, 152—£582 2s. 6d.; Cawood's Hope, 114¼—£461; Kareepan, 140¾—£304 17s. 6d.; Dievedraai, 93½—£192 17s.; Eastleigh, 19—£146; Panfontein, 94½—£134 9s.; Rietput, 49¾—£126; Kuilfontein, 60—£101 5s.; Zoutpan, 35—£85; Mooifontein, 24½—£80 10s.; Greylingslyn, 16—£47 10s.; Vanaswegenshoek, 10¼—£46 15s.; Diamantdoorns, 28¾—£46 5s.; Koppiesvlei, 10—£59 12s. 6d.; Kareepan, 5—£37; Brandewynskuil, 7½—£35 2s. 6d.; Olievenfontein, 21¾—£36; Rondevlei and Doornbult, 15—£30; Kromellenboog, 11—£26 15s.; Zevenfontein, 9½—£20; Schweizer-Reneke, 12½—£18 15s.; Avondster, 11—£13 11s. 6d.; Goedgenoeg, 3¾—£12; Modderkraal, 3½—£6 8s. 6d.; Homansvlei, 2—£6; Goedehoop, 1—£4 10s.; Abrahamzynkraal, 3¾—£3 15s.; Maroetjesfontein, 3¼—£3 5s.; Zwartlaagte, 1¼—£2.

November. For November the total yield amounted to 832¾ carats, value £1,948 17s. 6d. No stones of over 10 carats in weight or £100 in value were reported. The returns of the individual diggings were as follows: Bloemhof, 218 carats—£521 1s.; London, 166¼—£337 11s. 6d.; Eastleigh, 42½—£209 10s.; Dievedraai, 84½—£162 17s. 6d.; Cawood's Hope, 82—£158 2s. 6d.; Kameelkuil, 37—£141 10s.; Christiana, 36½—£86; Panfontein, 64—£84 5s.; Diamantdoorns, 27½—£79 5s.; Kuilfontein, 33—£76 15s.; Modderkraal, 4½—£20; Rondevlei and Doornbult, 6¼—£15; Greylingslyn, 5—£14; Zwartlaagte, 4—£11; Goedehoop, 7—£10; Mooifontein, 5¾—£8 15s.; Vechtvallei, 5½—£7 10s.; Vanaswegenshoek, 2½—£3 5s.; Goedgenoeg, 1—£2 10s.

KILLARNEY'S NOVEMBER OUTPUT.

The diamond output of the farm Killarney during the month of November amounted to 212¾ carats, valued at £865 2s. 6d., including one stone of 46½ carats, valued at £460.

GOLD MINES YIELD, COSTS, AND PROFITS IN NOVEMBER.

Transvaal Chamber of Mines' Monthly Analysis of Gold Production.

THE WITWATERSRAND.

	Total value recovered	Value recovered per ton milled.		Total working cost per ton milled.		Working profit.	Working profit per ton milled.	
	£	s.	d.	s.	d.	£	s.	d.
1. Aurora West United ...	16,685	23	7	17	11	4,257	6	2
2. Bantjes Consolidated ...	24,684	22	5	23	8	*1,703	*1	6
3. Brakpan Mines	74,458	27	10	18	7	24,388	9	2
4. City & Suburban	52,145	35	10	21	4	22,201	16	6
5. City Deep ..	88,051	40	0	21	7	39,750	18	1
6. Cons. Langlaagte	66,124	26	4	13	10	31,348	12	6
7. Cons. Main Reef	34,449	31	5	21	8	10,222	9	5
8. Crown Mines	243,922	26	6	16	5	90,864	9	10
9. Durban Roodepoort	14,918	21	4	15	7	4,030	5	9
10. Durban Rood't Deep	30,855	25	7	21	9	4,297	3	7
11. East Rand Prop. M.	219,323	25	9	17	8	64,669	7	10
12. Ferreira Deep	98,526	35	4	17	11	47,552	17	1
13. Geduld Proprietary	35,532	32	2	22	11	10,131	9	2
14. Geldenhuis Deep	62,701	26	8	22	0	10,497	4	6
15. Ginsberg	16,965	21	9	17	0	3,696	4	9
16. Glencairn Main Reef	14,667	13	4	11	4	2,120	2	0
17. Govt. G. M. Areas	35,388	17	5	20	8	*6,721	*3	4
18. Knight Central	27,784	22	1	18	7	3,837	3	1
19. Knights Deep	77,521	16	4	12	2	18,774	3	11
20. Langlaagte Estate	60,241	22	5	18	4	16,045	6	8
21. Luipaardsvlei Estate	17,981	19	6	18	5	703	0	10
22. Main Reef West	25,210	23	0	18	11	4,187	3	10
23. May Consolidated ..	9,082	15	6	14	8	480	0	10
24. Meyer & Charlton	33,319	45	10	17	9	20,298	27	1
25. Modderfontein B.	73,673	35	1	14	3	43,005	20	4
26. New Goch ..	31,348	20	10	13	11	10,163	6	9
27. New Heriot	22,980	35	8	20	6	9,513	14	9
28. New Kleinfontein ...	66,863	27	11	18	4	22,163	9	3
29. New Modderfontein ..	98,777	39	6	15	8	58,684	23	6
30. New Primrose	22,309	21	0	13	3	8,248	7	9
31. New Rietfontein	6,673	16	1	17	11	*426	*1	2
32. New Unified	13,406	20	0	12	6	4,991	7	7
33. Nourse Mines	64,302	28	6	21	10	14,477	6	5
34. Princess Estate	28,116	25	8	24	10	928	0	10
35. Randfontein Central	243,318	23	3	16	4	70,305	6	9
36. Robinson	83,757	30	6	13	7	45,555	16	7
37. Robinson Deep	76,897	30	9	18	0	27,905	11	2
38. Roodepoort U.M.	30,010	18	0	16	7	2,136	1	3
39. Rose Deep	73,579	25	2	16	1	25,881	8	11
40. Simmer & Jack	88,701	25	4	12	0	34,123	9	9
41. Simmer Deep	52,124	18	6	15	8	3,504	1	3
42. Spes Bona Tribute ...	5,110	19	3	—		—	—	
43. Van Ryn	48,212	25	9	13	11	21,823	11	8
44. Van Ryn Deep	69,663	34	6	15	9	37,893	18	9
45. Village Deep	71,846	29	2	17	7	27,927	11	4
46. Village Main Reef	46,848	40	11	22	1	21,182	18	6
47. Vogelstruis Estate ...	13,563	19	9	18	11	1,219	1	10
48. West Rand Central	3,462	33	2	27	10	553	5	4
49. West Rand Cons.	32,605	23	3	18	3	6,858	4	11
50. Witwatersrand	51,933	24	8	13	2	24,128	11	6
51. Witwatersrand Deep	60,704	28	10	17	10	22,039	10	5
52. Wolhuter	39,245	24	0	16	6	11,647	7	2
Miscellaneous Producers	11,050	—		—		—	—	
Witwatersrand totals	2,911,605	26	3	17	0	982,346	9	0
				51 cos.		51 cos.	51 cos.	

OUTSIDE DISTRICTS.

	Total value recovered.	Value recovered per ton milled.		Total working cost per ton milled.		Working profit.	Working profit per ton milled	
	£	s.	d.	s.	d.	£	s.	d.
HEIDELBERG								
1. Nigel ..	21,353	35	3	24	6	3,012	5	1
2. Sub-Nigel	10,007	45	6	36	7	1,625	7	5
BARBERTON								
3. Barrett ...	1,248	7	9	—		—	—	
4. Fairview (T.C.L.) ..	3,037	33	9	22	9	950	10	7
5. Sheba	12,013	36	5	24	5	3,908	11	10
6. Worcester Exploration ...	4,528	14	1	12	1	813	2	8
KLERKSDORP								
7. Quest G.M. & Dev. Co.	3,317	23	10	17	11	815	5	10
LYDENBURG								
8. Ceylon Lydenburg	858	24	8	21	1	112	3	3
9. Glynn's Lydenburg	6,983	35	3	19	5	3,050	15	5
10. Rietfontein (T.C.L.)	1,266	29	4	23	9	217	5	0
11. Transvaal G.M. Estates ...	37,045	50	4	20	2	21,706	29	6
Miscellaneous producers	27,417	—		—		—	—	
Totals (outside districts)	129,072	35	5	22	1	36,208	13	5
* Loss.				10 cos.		10 cos.	10 cos.	
Totals (Witwatersrand)	2,911,605	26	3	17	0	982,346	9	0
				51 cos.		51 cos.	51 cos.	
Grand totals	3040677	26	6	17	1	1018554	9	1
				61 cos.		61 cos.	61 cos.	

Manicaland Output.

The mineral output of the Territory of the Companhia de Moçambique (Manicaland) for the month of November, 1914, was as follows:—Reef: Mill: Gold won (fine), 257 ozs. 19 dwts.; tons, 552; value, £1,069 7s. Concentrates (estimated): Gold (fine), 10 ozs.; tons, 5; value, £42; also contains silver and lead, estimated value, £25 11s. 8d. Cyanide: Gold recovered (fine), 18 ozs.; tons, 275; value, £74 11s. 10d. Alluvial: Gold recovered (fine), 618 ozs. 7 dwts. 19 grs.; cubic metres treated, 56,217; value, £2,563 9s. 7d

MORE "SAFETY FIRST" LESSONS FOR THE RAND.

Details of the Safety Movement in the Lake Superior Iron Region.

[BY EDWIN HIGGINS, PITTSBURG, PA.][*]

INTRODUCTION.

It is the purpose of this paper to set forth the relation and functions of the various organisations and institutions engaged in the promotion of safety in the iron mines of the Lake Superior region; also to indicate the value of this work. Ten to fifteen years ago there was practically no organised safety work; the accident rate was high, excessively so in some districts, and dangerous practices and conditions existed in many of the mines. During recent years, however, a gradual change for the better has been made. The chief causes of this change have been (a) public opinion, which has set the stamp of disapproval on the disregard for human life; (b) certain State laws which have made the operators responsible in dollars and cents for injuries to workmen; and (c) the humanitarian attitude of many of the operators, who have always decried the great loss of life in the mines. To-day the Lake Superior region as a whole stands second to no other metal-mining district in the United States in its efforts to promote the welfare and safety of the miner. Dangerous practices in and about the mines are fast disappearing. The operators are ready and eager to adopt any expedient, rule, or device that holds forth a reasonable promise of reducing the hazards of the miner. To-day the value of a mine captain or shift boss is reckoned, not alone on his ability to "get the ore," but also on his capacity for reducing accidents. While the progress made has been remarkable, there still remains much to be done, for the accident records of the Lake Superior iron mines, while lower than those of the chief metal-mining regions of the United States, still compare unfavourably with those of the metal mines of practically all foreign countries.

ORGANISATIONS ENGAGED IN SAFETY WORK.

There are five organisations, or institutions, engaged in safety work in the Lake Superior region, viz.: The mining companies; county mine inspectors; co-operative range committees; Lake Superior Mining Institute; Federal Bureau of Mines. While each of these bodies covers well-defined features of the work, their activities are correlated to a certain extent. The mining companies, primarily, are concerned with conditions in their respective mines, but they cooperate with and receive aid from the other agencies mentioned. The county mine inspectors, whose duty it is to see that the mines are operated with due regard to the State laws, are of great assistance to the mining companies in suggesting remedies for dangerous conditions or practices. The co-operative range committees, made up as they are of officials and employees of all companies operating within a given radius, are a benefit to the body of operators of their respective ranges. The committee of the Lake Superior Mining Institute on practices for the prevention of accidents, concerns itself chiefly with questions of safety of widespread interest; it of course has the cooperation of the other bodies interested. The Federal Bureau of Mines is chiefly active in training miners in the use and care of rescue apparatus and in first aid to the injured; also, it has conducted special investigations of certain problems having to do with safety and efficiency in the mines. The unity of ultimate purpose and the strong co-operative spirit which have characterised the work of these five bodies have been important factors in the development of the conditions of to-day.

THE WORK OF THE MINING COMPANIES.

The bulk of the cost of the safety work has been and is still borne by the mining companies. In the main, their work has been to provide protective devices in and about the mines, and to educate the miners, by means of rules and regulations and various other methods, so as to enable them to protect themselves from injury. These objects seem easy of accomplishment, but there are obstacles of various kinds continually arising to hinder progress toward the desired end. Some of the most serious factors, most of which still exist to a greater or less extent, are the prejudice of the old time miner or boss toward safety regulations; carelessness and lack of interest in safety work on the part of the miners, and even the bosses; and at times the scarcity of labour, which necessitates the employment of less skilled and oftentimes ignorant men. The greatest problem to-day is not to secure knowledge of how safety work should be conducted, and what protective devices to use, but how to get the miner to use these methods and devices. Probably not 10 per cent. of the miners if subjected to an examination, would show even a passing knowledge of the contents of the books of rules and regulations. Safety devices, provided at great expense, are often found removed from their places, or disregarded entirely. The first problem of the mining companies was to provide for an organisation to carry on the safety work; then to devise means of protecting the miner and of educating him and securing his co-operation in the prevention of accidents.

ORGANISATION.

Practically every mining company in the district now has some individual, or organisation, whose duties relate solely to safety work. The larger companies have well organised safety departments. The following brief outline of safety organisations will indicate the usual procedure in this connection.—1. The mines covered by this organisation are large and are all situated on one of the iron ranges of Michigan. The safety department is in charge of an inspector and it is his duty to inspect all mines as frequently as possible and submit reports and recommendations to the manager. Periodical trips are made in and about the mines by a committee of mine foremen consisting of three members, each of whom is selected from a different mine. The inspector accompanies this committee and incorporates its recommendations in a report. Another committee, having similar duties, is made up of workmen. The activities of this committee, however, are limited to the mine from which it is selected. The members are changed after each inspection, so that in time all employees are given a chance to criticise conditions in and about the mine. All accident reports and safety recommendations are considered by a committee of mine superintendents, the head mining captain, master mechanic, assistant auditor, secretary of the pension department, safety inspector, and the manager, who acts as an ex-efficio member. This committee meets once a month and confirms or rejects safety recommendations. In addition to the above committees, there is one more made up of three mine superintendents. This committee investigates all fatal accidents and makes a report thereon to the manager. 2. The following form of organisation is employed by a company operating both large and small mines at various scattered points. The department is under an inspector, who, with the assistance of three experienced miners, inspects each mine of the company at least twice a week. After a mine is examined, a report, including any recommendations thought necessary, is sent to the safety inspector. The safety inspector in turn makes a weekly report to the superintendent, who looks after all recommendations having to do with upkeep. The safety inspector makes a monthly report in triplicate to the manager in which recommendations are submitted for approval. Such recommendations are made out to the head of the department concerned. When approved by the manager, one copy is returned to the safety inspector, to be kept by him until the indicated improvement is made. Two copies go to the superintendent, who keeps one and sends the other to the head of the department concerned. On the completion of the improvement, the head of the department sends the recommendation back to the superintendent, who then destroys his copy and sends the indorsement of completion to the safety inspector. The safety inspector destroys his record and files in its place the report showing that the improvement has been made. This report is in the form of a printed card with blank spaces filled in accordance to the needs. All company bosses and first-aid men meet once every two months to discuss all accidents that have occurred during the previous two months. The subjects discussed at these meetings are safety, sanitation, first aid and welfare. 3. A similar organisation to that described above is maintained by a company operating small groups of mines at scattered points. A chief inspector is in charge of the safety work at all the mines. The foremen's safety committee, consisting of four foremen from the mines of a certain district, works directly under the chief inspector. This committee makes a trip every three months through all mines of the district. Its personnel is changed after each inspection trip. The committee reports to the inspector, who, in turn, includes this report in his recommendations to the superintendent; a copy of the report also goes to the general manager. 4. This organisation operates in connection with one large mine. Inasmuch as the organisation was changed after the safety work was well under way, it may be well to point out the various steps in perfecting the organisation. An engineer was placed in charge of a department of efficiency and safety. He first made a thorough study of conditions in the mine and determined the principal causes of injury to the men employed. Finding that the greatest number of accidents occurred from falls of rock and ore, and from men falling down unprotected places in the mine, timber inspection was doubled and every place in the mine where it was thought that there was a possible chance for a fall to occur was timbered. All open places were protected by means of doors or gates. This movement effected an immediate and marked falling off in the number of accidents from the causes mentioned. Finally, three assistants were added to the department and each one of them was given a certain feature of the work to look after. This was necessary on account of the magnitude of the operation. The safety and efficiency work then developed into daily inspection trips by all the members of the department. Reports were made by them to the head of the department, who considered recommendations made and obtained immediate action thereon through consultation with the manager. Lately these daily inspection trips have been abandoned; the members of the organisation now average two or three trips a week through the mine. Daily meetings, attended by the manager, superintendent, head of the efficiency and safety department, and mine captains are held. Here all matters pertaining to efficiency and safety are discussed. As these meetings are held in the morning, it is possible to hear the reports of the shift bosses to the mine captain. In this way daily happenings and conditions in the mine receive prompt attention.

PROTECTIVE METHODS AND DEVICES.

Under the head of protective methods and devices it may be said, in general, that the work proceeds along the following lines:—A study of mining and timbering methods with a view to greater safety. A study of safe methods in every department of mine work The protection of dangerous places in the mine. Protective coverings for all exposed parts of machinery. Installation of safety devices in and about the mine. The provision of such tools and appliances as will result in the maximum safety to the employees. Installation of devices for protection against fire. The inspection of all working places, shafts, and machinery at stated intervals. The method of carrying on the inspection work is indicated in the descriptions of the various types of organisations. Nearly all the protective methods and devices are suggested through information gained on the inspection trips.

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[*] Paper read before A.I.M.E.

(To be continued.)

ECONOMIC GEOLOGY OF THE BELGIAN CONGO, CENTRAL AFRICA

[BY SYDNEY H. BALL AND MILLARD K. SHALER.]*

INTRODUCTION.

One who fifty years ago described the economic geology of the United States would have committed errors both of commission and omission, and the writers, in presenting this statement of knowledge of the economic geology of the Belgian Congo, are cognizant of the fact that the conclusions thereof will, in the future, be greatly modified. Although for the past forty-five years mining men have shown an interest in South Africa, it is only during the last two decades that contributions of importance have been made to our knowledge of the economic geology of the Belgian Congo. The first important descriptions resulted from Professor Jules Cornet's visit to the Katanga copper and iron deposits in 1892. Since that time scientific and prospecting parties sent out by the Colonial Government and by private companies, have furthered the knowledge of the economic geology of the Belgian Congo. The difficulty, not only of satisfactory observation, but also of travel in tropical countries must explain, in part, the many shortcomings of this article.

LOCATION AND AREA.

The Belgian Congo lies in south-western Central Africa to the west of the Great African Lakes. It has an Atlantic Coast line of but twenty miles, but widens rapidly eastward until it stretches to points five degrees north and fourteen degrees south of the equator. Its area is 908,000 square miles, or more than that of the United States east of the Mississippi River.

HISTORY AND PRODUCTION.

Iron and copper mines have been worked by the natives for centuries, and for at least 100 years some gold was won by the blacks for their Arab taskmasters from the Katanga streams. In the Katanga the white man began copper smelting about January 1, 1910, and between that date and the close of 1913, some 10,000 tons of copper have been produced. The present annual production is about equal to the above figure and further increases in the future seem assured. Prior to the white man's regime the blacks smelted many times this amount; Atherton, indeed, believes that at least 100,000 tons of copper were produced, and that in the process the natives mined over 1,000,000 tons of ore and waste. One of the almost limitless number of ancient pits is 720 ft. long, 30 ft. deep, and 480 ft. wide at one end, tapering to a point at the other. At Bembe (Portuguese West Africa, or Angola), and M'Boko Songo and Mindouli (French Congo), the neighbouring blacks also smelted considerable copper, and in the latter region a certain amount of lead.

Since 1904, when placer mining was begun on a small scale by white men, the colony has produced some $3,400,000 worth of placer gold. To this should be added an unknown, though probably small, amount of gold won in the early days, since Stanley reports that Zanzibarites, in his time, were washing some gold from the streams in the eastern portion of the Congo Basin, and Cameron states that the same traders got gold from some of the Katanga streams, even when the Tanganyika prospector entered the Katanga they were shown certain streams where in the old days a metal other than copper was won and when the Swahili word for gold "Zahabra" was pronounced one of the chiefs recalled it. The placers now operating should produce more than doube the above amount in the next ten years. For centuries native village smiths have smelted what in the aggregate must be a considerable quantity of iron ore. The ore usually employed as a porous limonite of recent formation. Some fifteen thousand carats of diamonds were produced in the Kasai region, during the last two quarters of 1913, and the output should increase considerably in the future. To date practically no tin has been produced. In 1906, however, some 10 tons of tin were smelted in a furnace locally made in the Katanga. Muika is now a small producer (in 1913 some 10 tons of cassiterite per month), and Busanga will soon be exploited.

PHYSICAL GEOGRAPHY.

From north to south Africa consists of three topographic units: (1) The Atlas Mountains, a rugged region of closely folded rocks; (2) the Soudan and Sahara deserts, a more or less accidented plain, the rocks of which are in the main horizontal and: (3) the Central and Southern tablelands, and the Abyssinian Plateau, underlain by intensely folded older, and horizontal younger, rocks. With the exception of the Coastal Plain the Belgain Congo lies within this last region, and consists from west to east of: (1) A narrow coastal plain along the Atlantic Ocean, flanked on the east by (2) an ancient mountain range, once peneplained, but now eroded to a highly accentuated plateau, and frequently referred to as the Crystal Mountains. The higher points reach an altitude of 2,300 ft. The mighty Congo River, encountering the differently resistant rocks of this region, rushes through it in a series of rapids and low waterfalls, forming the non-navigable stretch between the lower and the upper Congo River. (3) The great interior region, a basin sloping gently to Lake Leopold II. (altitude 1,110 ft.). The limits of the basin to the north (altitudes from 2,500 to 4,200 ft.) and to the south (from 4,000 to 5,200 ft.) are not particularly mountainous, but to the east are (4) the Eastern Frontier mountains, in height averaging about one mile above sea-level, although Ruwenzori has an altitude of 16,800 ft. These mountains are in part due to folding, but largely to north and south faulting, and to some extent to genetically related volcanic phenomena. Except for a small area in the extreme north-east watered by the Nile, the whole colony is drained by the Congo river and its tributaries. With the exception of Brazil, no tropical country is blessed with such a system of waterways as that offered by the Congo and its more important affluents, the Kasai, Sankuru, and Ubanghi Bertrand gives its length as 4,640 km., and states that the Congo is the sixth longest river in the world. Contrary to general opinion, one-half of the Belgian Congo is savanna, the other half forest. Practically all of the great equatorial forest lies between the fourth parallel south and the fourth parallel north, and most of it lies to the south of the great horseshoe bend of the Congo river. Elsewhere groves or even small forests are not unusual, yet the country is typically grass land, with sparse and generally scrubby trees. A narrow fringe of dense forest usually, however, borders the streams. The climate is tropical with heavy rainfall, high humidity, and relatively high, though diurnally variable, temperature. Abundant rainfall, or its absence, characterises respectively a rainy and a dry season, except along the equator, where it rains more or less continuously throughout the year. A degree away from the equator, however, the seasons are well marked; the dry season, which is considerably cooler to the north of the equator, begins late in November and ends late in May, and is followed by the rainy season. February is very dry, and November the month of greatest precipitation. The seasons are naturally reversed south of the equator.

GEOLOGY.

The coastal plain is underlain by gently folded sandstones, limestones and shales of marine origin, which have a general inclination toward the ocean. These rocks, which are covered by recent alluvium at the Congo mouth, are, according to Zobinsky, of Tertiary and Cretaceous age. The so-called Crystal Mountains consist of rocks presumably of Paleozoic and pre-Cambrian age, which strike N.N.W.-S.S.E., with a predominant dip to the east. The older rocks of the series occupy the western portion of the belt, and the degree of metamorphism increases progressively from east to west. Apparently the oldest members are mica-schists and sericitic quartzites, interbedded with which are chlorite- and epidote-schists, representing either basic lavas, contemporaneous with the sedimentary rocks, or very ancient intrusive bodies of basic igneous rocks. Of later origin are intrusive granite and gabbro, now mashed and recrystallised into gneisses. Large bodies of massive granite and smaller ones of diabase intrude the foregoing. To the east of these rocks, which, with the exception of the diabase, are considered presumably to be of pre-Cambrian age are limestones and calcareous schists. These, near the ancient complex, are closely folded, but are flat-lying further east, half-way between Matadi and Leopoldville. They are considered by E. Dupont to be of Devonian age. To the east they are unconformably overlain by red sandstones, limestones, arkoses, and shales, the Kundelungu (Permian) of Cornet. The interior basin is covered by interbedded sandstones and shales of Jura Triassic age, which are either flat or dip gently towards its centre. This Lubilache formation rests on the slightly undulating surface of the pre-Cambrian and Paleozoic rocks, and apparently in part feathers out on the upper slopes of the basin. As the border is approached isolated inliers of older folded and faulted rocks begin to appear in valleys which cut through the sandstone-shale blanket. These older rocks underlie the greater portion of the rim country, and are similar, in a general way, to those of the Crystal Mountains. They consist of very ancient mica-schists and quartzites, and igneous schists and gneisses, which are intruded by gabbro and granites. Younger than many of the granites are folded sandstones, quartzites, slates, shales and limestones. Cornet, in referring these two series of rocks respectively to pre-Cambrian and Paleozoic time, is, without much question, correct, although, unfortunately, diagnostic fossils have never been found in the sedimentary rocks.

(To be continued.)

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*Published by permission of the Societie Internationale Forestiere et Miniere du Congo in "Economic Geology."

Rhodesian Section.

LATEST MINING NEWS.

Lonely Output—Rhodesia Broken Hill Development—Charterland and General Exploration—Pickstone Gold Mines' Amalgamation—Romola Nigel

Below are the results of operations from the Lonely mine for the month of November:—Mill ran 339 hours; crushed 3,110 tons; yield of fine gold, 420·572 ozs.; value, £1,767 17s. 11d.; slimes treated, 3,110 tons; yield of fine gold, 2,165·164 ozs.; value £9,102 14s. 7d.; total recovery of fine gold, 2,585·736 ozs.; total value, £10,870 12s. 6d.; estimated profit, £4,070.

* * * *

The report of the Rhodesia Broken Hill Development Company for the year ended August 31, 1914, states that the issued capital is £160,270 in 641,083 shares of 5s. each, leaving 758,917 shares in reserve. The property consists of an area of 35 square miles of land carrying mineral and surface rights located in one block, enclosing mineralised kopjes or outcrops, and is held subject to the uncommuted rights of the British South Africa Company in the minerals. The preliminary plant capable of treating 50 tons of ore per day began to arrive at the mine in June, 1914, and its erection was immediately commenced. Unfortunately, some parts of the smelter are on board ship interned at a neutral port, and cannot be delivered for an indefinite time. These parts are, however, being replaced at a small cost, and it is expected they will be delivered at the mine by the end of February, 1915, after which a few days ought to complete the smelter. Pending the arrival of the smelter parts a test lot of 1,000 tons of ore will be put through the concentration plant. It is expected that this test will be completed by the end of January, 1915; the concentrate obtained will be smelted as soon as the smelter is completed. Experiments for the treatment of the zinc values of the ore will be proceeded with as soon as results have been obtained from the lead values. The lead-smelting process to be adopted will incidentally drive off a large amount of zinc in the form of fume containing about 70 per cent. of zinc, and as a step towards the utilisation of the zinc values in the ore the present plant has been equipped with a bag house and accessories to collect this rich zinc product. The British South Africa Company has recently agreed that lead may be smelted and sold up to December 31, 1917, free of royalty, instead of up to December 31, 1916. This arrangement will be reconsidered should the plant be increased beyond a capacity of 100 tons per day. The Government has surveyed and laid out stands on the area of 2,000 acres reserved within the company's concession for township purposes. The stands are held by the British South Africa Company and this company on half shares. A few town stands have been sold during the year and others leased at satisfactory rentals.

* * * *

After distributing modest dividends for three years in succession, the Charterland and General Exploration and Finance Company—which was reconstructed five years ago—has relapsed into the recently unduly swollen ranks of the non-dividend payers. Its revenue for the year ended 31st August last was actually nearly £3,000 higher at £54,880, but the debit side of the profit and loss account is weighed down this time by an item of £7,860 in respect of "loss on balance in respect of shares, etc., realised and written off." The result is that the net profit is under £4,000, against over £9,000 a twelvemonth ago. With the balance brought in there is a total of £15,705 at credit of profit and loss account, but against this must be set an estimated net temporary depreciation in debenture and shareholdings of £15,017. However, the financial position of the company is sound enough, the liquid assets, together with the debtors, which are all regarded as good, amounting to about £37,500. The encouraging feature of the report is an increase on the year from under £1,700 to well over £6,000 in the profit realised from sales of farm lands in Rhodesia. On the other hand, the apparent "petering-out" of the Old Nic mine in depth is disappointing.

* * * *

The second ordinary general meeting of the Pickstone Gold Mines, Ltd., was held at the offices of the company, Duchess Hill, Hartley, on Wednesday, the 16th inst., Mr. A. E. Ward presiding. The Chairman said: Gentlemen, I presume that, as usual, you will take the report and accounts as read. A reference to the latter will show that the company made a total profit during the year of £7,851 5s. 3d., which, after providing a fund of £2,870 4s. 8d. for depreciation on plant, left a net profit of £4,981 0s. 5d., equal to, roughly, 14 per cent. on the issued capital, which cannot be regarded as unsatisfactory. Owing, however, to the large amount of capital expenditure necessary to equip the mine—a sum of nearly £11,000 has been appropriated for this purpose out of profits over and above the capital originally subscribed—we still find ourselves with a liability of £3,162 2s. 9d. over cash and cash assets at the end of our financial year. I regret to state that since that date the liabilities have considerably increased. For the past three months our water supply has been totally inadequate for the requirements of the mine, with the result that we have been running less than half time, which, in view of the low grade of the ore mined, has been insufficient to meet the working expenses. All capital expenditure, except shaft sinking and so forth, has, however, now been completed, and with the advent of good rains, we look forward to being able to run full time and earn good profits. In the meantime, however, it is necessary that arrangements should be made at once to support the financial position of the company in order to satisfy our creditors and to keep the mine going and intact for the benefit of shareholders, your directors being confident of the value of the mine in depth. Owing to the difficulty at the present time of raising money, negotiations were entered upon for the amalgamation of this company with the Glenrosa Mine, Ltd., a company which at the present time is earning substantial profits, which amalgamation would provide funds for the requirements of this company. I am now in a position to report that your directors have entered into a provisional agreement with the Glenrosa Mines, Ltd., by which this company, under certain conditions, acquires the property and assets of the Glenrosa Mines as at 1st December, for 80,972 fully-paid 5s. shares of the Pickstone Company. I now move that the report of the directors produced, together with the audited statement of the company's accounts, be approved and adopted." In seconding the resolution, Mr. W. McD. Stokes said: "The policy of your board throughout the past year has been one of rigorous development; and further assay returns of development work since the report was published confirm my previous expressed opinion that in Pickstone West you have indications of a mine which should have a long and profitable life in front of it. Every endeavour should be made to secure the full benefit of these profits for the present shareholders, and it is for this reason that I favour the method of raising the necessary funds, viz., by amalgamation with another mine which is earning good profits and has also good prospects."

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Mr. E. J. Sivewright presided at the meeting of the Romola Nigel Gold Mining Co., Ltd., held this week. Out of a total share issue of 297,936, 78,145 shares were represented. The directors' report stated (inter alia): The capital of your company remains the same as last reported to you. During the year £800 of debentures have been subscribed for, making £25,225 out of £30,000 authorised. The amount of £1,379 6s. 4d. shown in the balance sheet is made up of £968 18s. 11d., being interest to date on debentures, and fees due to your directors and the secretary, £162 10s. and £180 respectively, and sundry small items outstanding at the mine. It has been agreed that the fees to the directors and secretary will be satisfied by the issue of debentures. Property Account. This account has been increased by the sum of £1,202 15s., being purchase price of the Star blocks, and preliminary and incidental expense in connection therewith. It will be remembered that in April last year a circular letter was addressed to each shareholder asking for subscription for a further issue of debentures to put the company in funds and to enable it to proceed with the development of the property on a proper scale, as recommended by your manager and fully explained in the circular, but as little or no money was forthcoming your directors had no alternative but to shelve this policy. Your directors thought that it would be a pity to allow the property to lie idle and have recently instructed your manager to proceed with the policy outlined on a small scale in conjunction with the Star of Rhodesia, Ltd., which company continues to operate under agreement entered into on November 28 last, details of which were reported to you at last annual meeting. In connection with this agreement, since the closing of the accounts, the Star of Rhodesia, Ltd., after spending £1,000 on development were unable, on account of the existing financial depression, to fulfil their obligations, and agreed to hand over all interest to this company free of charge, in consideration of their being released from any further liability. This was accepted and the position to-day is that your company holds 3,600 fully paid and 3,889 shares on which the amount of £97 15s. has been paid in the Star of Rhodesia, Ltd., out of an issued capital of 8,150, 5s. shares, and reap the benefit of the amount spent on development by that company. The directors are in receipt of report from your manager that in sinking the main shaft on the Star property a reef was struck at a depth of 45 feet assaying 49 dwts. across 18 inches, and at 50 feet this reef was still in shaft assaying 31.25 dwts. across 36 inches: your manager also reports that good rains have fallen, and that he hopes shortly to be in a position to crush day and night instead of about 10 hours only daily as he has been doing lately on account of scarcity of water. He reports also that a new reef has been struck on Granger property panning very well, and that a trial crushing would be made shortly. In the course of his report, the manager stated that with regard to the Star blocks, the ore developed and partly developed worked out as follows:—Developed ore, 1,060 tons, assay value 10.8 dwts. across a stoping width of 30 inches; partly developed ore, 5,000 tons, assay value 11.5 dwts. across a stoping width of 30 inches; total, 6,060 tons; gold contents valued at £14,477. Messrs. E. J. Sivewright and J. Donaldson were re-elected to the board, and Mr. D. Rintoul was re-elected auditor.

RHODESIAN MINERAL OUTPUT IN DETAIL.

Official Returns of Gold and Mineral Output from Southern Rhodesia for the Month of November, 1914.

We have received for publication from the office of the Rhodesia Chamber of Mines (Incorporated) the following detailed statement of the mineral output for the month of November, 1914, with comparisons and values:—

MATABELELAND.

	No. of Stamps.	Tons Treated.	Yield. ozs.	Value £
Bulawayo District—				
Abercorn (W. J. Lane)	5	192	120·60	500
Antelope G.M. (Rhod.), Ltd.	2B 2P 1T	3,762	1,178·22	4,884
Do. (slimes)		3,386	909·89	3,772
Antenior (W. J. Lane)	5	236	61·38	254
Do. (sands)	–	227	34·60	143
Atlas (Est. R. Barkley)	10	228	24·50	102
Basch (Morrison & Granger)	5	300	62·83	260
Bassick (Bassick M. Syndicate)	5	108	88·68	368
Blue (J. Eissenhamer)	2	120	37·00	153
Bobs (F. W. Spencer)	10	500	57·58	239
Bucks Reef G.M., Ltd. (J. Black)	5	562	139·80	579
Do. (sands)	--	469	43·36	180
Bushtick Mines, Ltd.	28 2T	5,194	365·44	1,508
Do. (sands)	–	2,851	313·04	1,285
Do. (slimes)	–	2,195	162·87	668
Calli (Triggs & Huntley)	(5)	146	118·81	493
Claremont (B. L. Whyte)	—	541	15·54	64
Colleen Bawn (Colleen Bawn (Syd.)	6 2P	708	59·72	248
Do. (sands)		300	65·80	273
Do. (slimes)	–	408	121·66	504
Dam (W. H. Robinson)	2	206	36·74	152
Donove A. (W. K. Early)	3	12	7·57	31
Eagle A. (Macdonald & Co.)	10	735	320·12	1,319
Do. (sands)	–	264	26·47	110
Elumba A. (Cooper & Bosomworth)	5	640	196·09	813
Do. (sands)		310	94·74	393
Ettie (R. Smith) ...	3	280	180·79	749
Farvic (H. S. Henderson)	5	742	223·81	928
Do. (sands)		441	22·06	91
Fiery Cross (J. A. Warwick)	5	225	19·25	79
Do. (sands)	–	200	24·22	99
Flora (E. E. Beecroft)	5	707	139·59	579
Formby (Baldwin & Nield)	3	257	103·04	427
Fred (Transvaal and Rhodesian Estates, Ltd.)	10 2P	1,950	1,187·53	4,899
Do. (sands) ..	—	1,950	289·68	1,201
Godwin B. (Barrett & Stacey)	5	295	179·96	746
Do. (sands)	–	135	17·95	74
Golden Butterfly (Wheeler, Davis and Rintoul)	5	438	126·47	524
Gold Prince (W. Pichanik)	4	65	50·18	191
Gray Cloud (A. D. Hall)	5	97	27·58	114
Intabanenda (Intabanenda Synd.)	5	245	85·02	352
Do. (sands)	--	200	21·54	89
Jumpers (J. P. McCay)	5	500	175·46	727
Do (sands)	–	300	65·75	273
Klondyke (Lummun & Stiver)	3	25	18·04	75
Last Luck (G. Reynolds)	Pannings	—	1·64	7
Liberty (Liberty Syndicate)	1H	280	149·93	617
Lone Hand (Armstrong Furber and Alexander)	5	360	133·54	554
Do. (sands)		210	43·16	179
Do. (sands)		630	40·22	167
Matabele Queen's Co., Ltd.	10	1,610	270·28	1,120
Lonely Reef G.M. Co., Ltd.	20 2T	3,110	420·57	1,743
Do. (slimes)	—	3,110	2,165·16	8,976
Long John (Susanna Mines, Ltd.)	13	1,846	105·10	433
Do. (sands)	–	1,549	172·66	716
Mary and Alice (R. Dodman)	3	78	17·41	72
Master Cecil (Branson & Schabbel)	3	20	10·68	44
Matabele 3 (Criterion G.M., Ltd.)	10	910	218·88	907
Do. (sands)	—	1,610	423·00	1,754
Do. (slimes)	–	535	76·50	317
Mayfair (Arbery & Hicks)	5	780	216·44	891
Do. (sands)		308	62·05	257
Minnie's Luck (Mr. Reid)	5	308	82·13	339
Morven (C. A. Stevenson)	5	130	21·64	89
Nelly (F. D. Roscoe)	3H	357	187·57	767
Do (sands)		630	104·70	434
New Eclipse (J. R. Stewart)	5	552	192·14	796
Do. (sands)	—	300	28·90	120
Old Nic (Chart. and Gen. E. and F. Co., Ltd.)	15 4P	2,534	736·55	3,053
Do. (sands)	—	1,456	196·75	816
Peach A. (Peach Synd.), sands		253	34·42	143
Penzance (Penzance Trib. Synd.)	2	140	16·32	68
Do. (sands)	--	64	36·80	153
Planet (Triggs & Huntley), sands	--	312	54·96	228
Princess 2 (C. A. Abbott), sands)	—	220	33·08	137
Reward (J. Fritz)	Pannings	1	6·86	28
Rhodesian Queen (I. Gilpin)	5	533	85·62	355
Roan (Robinson & Berwitz)	4	340	56·56	234
Rous I. (A. G. Hadingham)	-	-	16·92	70
Star (Romola Nigel G.M. Co., Ltd.)	5	264	119·51	495
Do. (sands)		203	32·81	136
St. Serf (J. Cook)	3	20	21·19	88
Teutonic (MacDonald & Boushor)	5	190	114·48	475
Umvoti (Henderson & Toshack)	2	100	16·14	67
Do. (sands)	-	350	19·28	80
Winifred (Exchange Syndicate)	5	382	128·41	528
Do. (sands)		210	39·17	163
Wolley Dog	2	78	86·43	356
Bulawayo district total			14,617·53	60,484
Gwelo District—				
Alderman (Williams & Woodger)	3	67	47·71	198
Ardpatrick (J. E. & F. Maleham)	3	250	100·63	417
Bell Reef Dev. Co., Ltd.	2B 1T	3,200	1,747·93	7,247
Bonsor B323 (Cornish Syndicate)	10	648	141·18	585
Bonsor B327 (T. Roberts) ..	10	600	71·88	[illegible]
Cactus (Renton & Gray)	5	280	62·11	257
Do. (sands)	—	255	45·58	189
Camelia (S. Levin)	10	1,375	232·20	963
Do. (sands)	—	600	66·81	277
Cinderella (P. Burt)	1E	285	20·47	85
Cissy (G. Nicholson)	1H	237	32·28	134
Collingwood (Pini & Wearing)	5	250	55·85	232
Do. (sands)	—	250	19·16	79

	No. of Stamps.	Tons Treated.	Yield. ozs.	Value. £
Csardas (Wolfshall Synd.)	10	650	588·30	2.439
Do. (sands)	—	401	95·84	397
Do. (slimes)	—	149	18·60	77
Eileen (M. L. Price)	5	200	30·79	128
Falcon Mines, Ltd.	20 2T	11,408	3,337·93	14,019
Do. Copper, £12,757.				
Gaika G.M. Co., Ltd.	5 1C	3,151	1,580·31	6,637
Do. (sands)	—	1,287	59·95	252
Do. (slimes)	—	806	42·50	179
Gantly (Mrs. Grant), sands	—	146	17·46	72
Gantly (H. C. Baker)	2	60	7·40	31
Glen Rosa No. 7 (D. H. Currie)	5	330	430·68	1,785
Do. (sands)		350	194·52	806
Globe & Phoenix G.M. Co., Ltd.	40 10P	5,956	8,211·65	34,489
Do. (sands)	—	1,499	502·50	2,110
Do. (slimes)	-	1,781	345·63	1,452
Do. (concentrates)	—	269	527·14	2.214
Gretna Green (M. L. Price)	5	65	42·66	174
Guinea Fowl (J. T. Woods), sands	—	400	3·75	16
Little Blossom (J. Hazlehurst)	2	70	39·25	163
May's Luck (J. Jones)	6	20	9·18	38
Moss (W. M. James)	2	750	359·50	1,490
Do. (sands)	—	504	37·80	157
New Dunraven G.M. Co., Ltd.	5	880	104·52	433
Do. (sands)	—	720	40·28	167
Nil Desperandum (J. Waterworth)	3	18	5·44	23
Pompei (Bolt & Franks)	5	150	58·32	242
Do. (sands)	—	300	9·73	40
Pondo (F. C. Luxat)	5	504	209·28	868
Do. (sands)	—	310	45·68	189
Redhill Development Syd., Ltd.	1 C	3,887	26·29	109
Do. (sands)	—	1,500	80·01	331
Shamrock (Crampin & Masters)	10	850	100·64	417
Do. (sands)	—	600	27·99	116
Somerset (F. C. Luxat), clean up	-	-	54·38	223
Do. (sands)	-		29·43	122
Tebekwe B 81 (A. N. Tyrrell)	15	385	104·67	435
Do. (sands)	—	1,100	127·27	528
Tebekwe 1 (A. N. Tyrrell)	—	1,033	279·79	1,160
Taxul (F. C. Luxat)	1H	230	71·27	295
Do. (sands)	—	186	30·51	126
Tinker (A. Malcolm)	5	110	21·17	88
Wait and See (clean up)	-		13·34	55
Wanderer (Selukwe) G.M., Ltd.	4 GR	11.210	1.238·15	5.133
Watch (T. Pedlow)	5	112	21·15	87
Yankee Doodle (Bruhns & Schwarz)	10	1,281	300·56	1,246
Do. (sands)	—	840	217·17	900
Zabonkwe (Holmes & Urquhart)	5	710	41·28	171
Gwelo district total			22,385·75	93.590
Matabeleland total			37,003·28 ozs.	
Value			£154,074	

MASHONALAND.

Hartley District—

	No. of Stamps.	Tons Treated.	Yield. ozs.	Value. £
Agnes (P. S. Triggs)	5	540	188·90	783
Do. (sands)	—	200	11·78	49
Banshee (P. S. Triggs)	2	50	28·28	117
Brilliant (Mabel's Luck Synd.)	5 1P	1,053	402·69	1,670
Do. (sands and slimes)	—	595	41·07	170
Beroche A. (H. Moser)	6	490	158·72	658
Bijou (G. Hankins)	1C	62	67·72	281
Cam and Motor G.M. Co., Ltd.	Roasting	11,748	4,128·06	17,503
Cheshire Cat (Arnold & Windley)	5 1P	250	53·96	224
Do. (sands and slimes)	—	150	10·47	43
Concession and W. Ext. (C. E. Simpson)	5 1C 2P	1,693	395·76	1,640
Do. (sands)	—	1,225	74·18	308
Coquet G.M., Ltd.	5	120	16·88	70
Dalny (Macdonald & Sale)	5	890	92·49	383
Do. (sands and slimes)		450	169·85	704
Dalny 1 W. (Shagari Mines, Ltd.)	5	625	69·91	290
Do. (sands)	—	375	73·08	303
Dreadnought (W. E. Masters)	1C	428	102·84	426
Eiffel Blue (Willoughby's Cons. Co., Ltd.)	10	1,307	798·09	3,308
Do. (sands)	—	804	29·50	124
Eileen Alannah Mining Co., Ltd.	10 1T	1,939	[illegible]	2,092
Do. (sands)	-	2,451	714·61	2,965
[illegible] Ext. (E. G. Goodyer)	5	400	103·52	429
Do. (sands)		324	32·02	133
Giant Mines of Rhodesia, Ltd.	30 2T	1,500	[illegible]	[illegible]
Glasgow Mines, Ltd.	5	660	[illegible]	[illegible]
Do. (sands)		306	[illegible]	[illegible]
Glencairn (Glenrosa Mines, Ltd.)	5	[illegible]	[illegible]	[illegible]
Globe (clean up)			[illegible]	1
Golden Valley (J. [illegible])	[illegible]	[illegible]	[illegible]	[illegible]
Do. (sands)		595	[illegible]	[illegible]
Guelph (M. & J. Davidson)	3	75	[illegible]	61
Hepworth (L. Heilman)	2	46	9·04	37
Hilda (F. K. Keegan), pannings	-		7·19	30
Inez (Harrill & Smith)	10	1,020	289·70	[illegible]
Do. (sands)	-	600	77·61	323
Kanyemba (Kanyemba Synd.)	5	540	502·38	2,083
Do. (sands)	—	400	[illegible]	[illegible]
[illegible] (E. Jessop)	(3)	200	64·89	268
Lemberg (A. D. Bentley)	5	250	42·66	177
Masterpiece (J. McAdams), October	5	524	122·18	500
Do. (sands)	-	357	14·31	59
Do. (November)	(5)	564	119·86	497
Do. (sands)	—	306	16·18	67
Midwinter (Midwinter Synd.)	4	353	53·61	222
Do. (sands)	—	290	19·70	82
Mudale (E. A. McDowell)	2	120	59·03	245
Not Out (Alabama Syndicate)	2	70	36·59	152
Norman (Fraser & McBean), sands		350	82·00	340
Owl (A. Rolfe)	10	1,551	787·58	3.265
Do. (sands)		1.505	401·36	1.664
Oleander G.M. Co., Ltd.	3	180	42·60	177
Do. (sands)		300	24·26	101
Pickstone Gold Mines, Ltd. (sands)		846	126·93	526
Pomposo (J. Knott)	5	126	44·89	186
St. George (Hussey & Fraser)	2	73	98·56	408
Seigneury (Arnold & Windley)	5	374	156·12	647
Do. (sands)		256	16·46	68
Seven Sisters (Seven Sisters Synd.	3	200	54·35	225
Shepherds (Phœnician (Rhod.) Co., Ltd.)	5	820	185·91	771
Do. (sands)		1.010	110·42	457
Thistle-Etna G.M., Ltd.	1C	2.382	522·89	2.168
Do. (sands)		1.873	172·81	716
Trinity (G. C. Hooper)	3	109	45·95	190
Washington (I. J. Minnaar)	5	400	73·30	304
Do. (sands)	-	270	28·14	117
Hartley district total			15.344·61	63.961

Lomagundi District.—

	No. of Stamps.	Tons Treated.	Yield. ozs.	Value. £
Alluvial (P. L. Aitchison)			44·51	185
Do. (A. Coleman)			25·59	106
Do. (F. R. Needham)			24·46	101
Do. (P. J. Purcell)	-		41·52	171
Do. (A. Smith)			4·55	19
Anvil (R. W. Stone)	2	252	111·53	462
Eldorado Banket G.M. Co., Ltd.	15 2C 1P	5.413	2.929·79	12,305
Do. (sands)		5.729	1.356·43	5.967
Golden Kopje Propy. Mines, Ltd.	40 3T	8 146	671·51	2.820
Do. (slimes)		8.116	1.242·72	5.219
Lone Hill (Day & Mann)	2	90	21·69	90
May (May Syndicate), October	5	217	76·39	316
Do. (sands)		320	60·50	250
Do. (November)	5	241	52·18	216
Do. (sands)	-	203	36·94	153
Mediterraneo (Perhat & Babunizza)	2	45	24·41	101
N.G.F. Main W. Ext. (F. F. Standen)	2	198	62·19	258
New Celtic (Howard & Southey)	2	166	38·01	158
Lomagundi district total			6.824·92	28.625

Mazoe District.—

	No. of Stamps.	Tons Treated.	Yield. ozs.	Value. £
Alligator (R. Athey)	-	--	2·71	10
Botha H. (London & Rhod. M. & L. Co.)	5	2.300	124·24	515
Do. (sands)		1,020	143·27	594
Day Dawn (Day Dawn Tribute)	2	210	98·99	410
Do. (sands)		203	50·93	211
Jumbo G.M. Co., Ltd.	30	2.000	325·51	1,384
Do. (sands)		1.300	138·38	588
Do. (slimes)		700	110·39	469
Kimberley (Mash.) G.M. Co., Ltd.	8 2T	4.550	966·49	3,954
Do. (sands)		1.400	258·80	1,059
Do. (slimes)		3,150	210·97	863
Rand (Mickey Syndicate)	2	512	233·21	967
Rosary (R. Ricardo)	1 D	14	15·40	64
S.D.C. 3 E. (B. Byerley)	2	205	45·16	187
Tat (Oceola G.M. Co., Ltd.)	5	571	101·00	416
Do. (sands)	—	364	58·21	241
Venus (Giles & Southey)	2	138	64·15	266
Do. (sands)	—	200	2·11	9
Mazoe district total			2,950·04	12,207

Salisbury District.—

	No. of Stamps.	Tons Treated.	Yield. ozs.	Value. £
Arcturus (L. [illegible]), sand		[illegible]	61·12	253
Ceylon (Monarch Tatu G.M. Syndicate)	5 1P	[illegible]	227·22	[illegible]
Do. (sands)		1.179	267·52	[illegible]
Cross Your Luck (Sch. and Dist. Mines), October	2	220	[illegible]	[illegible]
Crown 1 S.W. ([illegible] Synd.)	2	[illegible]	[illegible]	[illegible]
Do. (sands)		[illegible]	[illegible]	115
[illegible]	1D	[illegible]	[illegible]	[illegible]
[illegible] (P. J. [illegible])	2	[illegible]	[illegible]	[illegible]
Joker (Harrison & Drabble)	2	[illegible]	[illegible]	165
Joking (Harrison & Drabble)		109	82·39	341
Koodoo (R. Tryon)	5	254	87·83	364
Louise Grand (H. S. Plane)	1H	1,061	56·37	234
Do. (sands)		963	62·96	261
Mont d'Or (Claxton & [illegible])	2	96	112·13	465
Do. (sands) (A. [illegible])	—	300	23·77	97
Mullingar (J. H. [illegible])	2	[illegible]	[illegible]	[illegible]
New Agnes ([illegible] Synd.)	5	[illegible]	74·18	[illegible]

	No. of Stamps.	Tons Treated.	Yield. ozs.	Value £
Old Loyalty (Shamva Hex G.M. Co., Ltd.)	5	639	140·77	[illegible]
Radnor (London & Rhod. M. and L. Co.)	5 2P	[illegible]	[illegible]	2,130
Shamva Mines, Ltd.	56 8T	41,781	2,225·52	9,347
Do. (sands)		18,704	1,887·20	7,926
Do. (slimes)		22,889	2,306·57	9,688
Zidonian (J. Wilson)	111	180	[illegible]	161
Salisbury district total			8,500·87	35,579
UMTALI DISTRICT.—				
Champion (J. Buchanan)	5	897	90·78	[illegible]
Do. (sands and slimes)	-	510	[illegible]	531
Fairview 3 W. (Branken and Markham)	5	[illegible]	[illegible]	[illegible]
Golden Quarry (Stots, Steyn and Pollock)	5	180	[illegible]	[illegible]
Kent Mines, Ltd	10	410	155·86	[illegible]
Do. (sands)	-	[illegible]	[illegible]	[illegible]
Liverpool (R. G. Snodgrass)	5	616	90·63	376
Do. (sands)	—	252	[illegible]	192
Montezuma G.M. Co., Ltd.	10	[illegible]	[illegible]	1,129
Pilgrim (O. R. Cawood)	10	[illegible]	72·65	301
Quagga (Thompson, Murdock and Kapnek)	[illegible]	275	[illegible]	[illegible]
Rezende Mines, Ltd.	105	11,900	[illegible]	[illegible]
Do. (sands)	-	[illegible]	302·18	1,282
Do. (slimes)	—	1,102	113·70	[illegible]
Do. (concentrates)	—	148	450·18	1,894
Umtali district total			[illegible]	[illegible]
VICTORIA DISTRICT—				
Empress (S.A. Prospecting and Concession Synd., Ltd.)	[illegible]	1,400	[illegible]	1,268
Do. (sands and slimes)	—	800	125·85	521
Reinhold (R. R. Schielke)	5	305	20·42	85
Texas (G. Scott)	10	302	290·65	1,205
Do. (sands)	--	750	172·29	714
Victoria district total			915·00	3,793

Mashonaland total	[illegible] ozs.
Value	£[illegible]
Total gold production	[illegible] ozs.
Value	£311,711

SUMMARY OF PRODUCTION.

		Value
Gold, ounces	74,739·94	£311,711
Silver, ounces	15,022·62	[illegible]
Copper, tons	255·14	12,757
Lead, tons	541·00	[illegible]
Asbestos, tons	[illegible]	[illegible]
Coal, tons (sales)	[illegible]	[illegible]
Diamonds, carats	65·25	[illegible]
Grand total value of production		£[illegible] 725

GOLD OUTPUT COMPARISONS.

	Ounces.	Value.
Gold output, October, 1914	81,165·02	£337,241
Gold output, November, 1914	74,739·94	311,711
Decrease	6,425·08	£25,53[illegible]
Gold output, November, 1913	[illegible]	[illegible]
Gold output, November, 1914	74,739·94	311,711
Increase	17,909·29	£72,675

Other Minerals.—Total to date: Silver, 1,862,992·[illegible] ounces; lead, [illegible] tons; copper, [illegible] tons; chrome iron, 321,12[illegible] tons; coal, [illegible] tons; tungsten ores, [illegible] tons; antimony, 15·75 tons; arsenic, 76 tons; asbestos, [illegible] tons; diamonds, [illegible] carats; other precious stones, [illegible] carats.

C., Chilian mill; T., Tube Mill; G.R., Gates roll; H., Huntington mill; P., Grinding pan; P., Pneumatic mill; D., Dolly.

THE MONTHLY TOTALS.

The following table shows the value of the monthly and annual gold outputs of Southern Rhodesia since January, 1912, together with the value of the annual outputs of other minerals:

	1912.	1913.	1914.
January	£[illegible]	£[illegible]	£[illegible]
February	[illegible]	[illegible]	259,888
March	215,102	257,797	273,237
April	[illegible]	[illegible]	[illegible]
May	[illegible]	243,452	[illegible]
June	220,667	240,303	306,421
July	240,514	249,302	320,670
August	[illegible]	250,576	316,972
September	230,573	250,429	309,398
October	230,072	247,068	337,241
November	225,957	239,036	311,711
December	213,661	254,687	-
Gold	2,707,369	2,903,268	3,270,539
Minerals	259,578	253,674	265,482
Total value	2,966,947	3,156,942	3,536,021

East Africa Syndicate.

To March 31 last the total of the prospecting expenses of the East Africa Syndicate was £32,242, and this is represented by the 150,000 fully paid deferred shares of 1s. each of the Magadi Soda Co., received in consideration of the surrender of the lease over the great soda deposit to Messrs. M. Samuel & Co. Cash and debtors amount to £4,138, against which there are creditors for £2,822. So far £1,070 has been expended upon selection in connection with the lease of 313,000 acres of land at Naivasha, over which the syndicate has an option to purchase for £50,000. Income last year was £1,313 and sundry expenditure £7,139.

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Sole Agents for South Africa: FRASER & CHALMERS, Ltd., Johannesburg, Bulawayo & Salisbury.

Engineering Notes and News.

A Model Copper Reduction Plant.

The copper reduction plant of the Mitterberger Kupper A. G. at Muhlbach, near Bischofshofen, which, completed in 1910, is regarded in German and Austrian metallurgical circles as embodying, from the technical as well as from the economic point of view, all the most important improvements resulting from modern practical experience and scientific perfection, is the subject of a most detailed description in the *Montanistiche Rundschau*. A wire rope line conveys the milling ores from the mine to the reduction works, which are erected in terraces on a hillside, so as to utilise gravity for transport. The plant consists of two rough sorting grates, two stone-breakers, five roller mills, one wet tube mill, two sorting tables, twenty one classifying drums, twenty four jiggers, one six pole and three eight pole electro-magnetic separators, nine Krupp tables, and six Ferraris tables, together with the required number of spitzlutten and spitzkasten. Its capacity is about ten tons per hour. For lifting, in the course of the reduction process, the intermediate products and slimes, two chain elevators and two centrifugal pumps have been installed. The milling ores are composed of copper pyrites, iron pyrites, spathic iron ore, quartz and shale; their Cu contents average 3·5 to 3·8 per cent. The first operation consists in successively passing the ores through two grades of 10 and 40 mm. distance respectively between the bars. The larger lumps (above 40 mm.) are crushed in stone-breakers, and, after being passed through screening drums of 50 mm. and 24 mm. mesh, they are freed on sorting tables from coarse spar and barren stone. The broken material is then conveyed to a drum of 10 mm. mesh, and all that passes through that drum is divided by means of a system of screening drums and spitzlutten into six grain sizes, varying from 7 to ·55 mm. This classified material is then conveyed to jiggers corresponding to the different sizes. Stuff between 24 and 10 mm. has to pass through rolls before classification in the screening drums and jigging. The smalls—*i.e.*, all material that has passed through the 40 mm. grate—are sorted on special tables, and all copper-containing pieces above 12 mm. are ground by the roller mills, after which they are subjected to the same treatment as the other products of these mills. All pieces under 12 mm. pass through a separate system of screening drums and spitzlutten, where they are classified for treatment in corresponding sets of jiggers. From the jiggers the stuff issues either as finished concentrates fit for transport to the smelters or as barren stone, which is removed to the dumps, or as intermediate products, which have to be submitted to further treatment by the electro-magnetic separators, where the spathic iron ore is separated from the copper pyrites, and the copper concentrates are formed. The capacity of these separators is about four tons per hour with a current consumption of about 1 kw. per ton. The overflow from the jiggers is, after treatment in the wet tube mill, concentrated by washing on the Krupp and Ferraris tables, where cupriferous slimes are produced. The overflow of the tables, after having been condensed in spitzkasten, is passed on to an Elmore separator. The finished products of the various branches of the reduction installation have the following Cu contents: Sorted ores, 10–11 per cent.; slimes from the table, 12 per cent.; Elmore concentrates, 10 to 14 per cent. The average Cu contents of the products shipped to the smelters is 12·5 per cent. In the residues remain ·5 per cent., in the spar ·8 per cent.

Engineering Trade Busy.

A Sheffield correspondent writes:—"Whilst warlike departments are extremely busy, those devoted to products for the peaceful arts are expanding remarkably well. A slight idea of the new business booked during the past week may be gauged from the fact that it includes large tonnages of special steel for Sydney, N.S.W., Johannesburg, Fremantle, Adelaide, Sekondi, Chicago, New York, and Melbourne; cutlery for Trinidad, Dominica, Rio de Janeiro, and Winnipeg; hardware for Calcutta, Brisbane, and Spain; saws for Calcutta—several orders—Madras, and South America; files for Lagos, Shanghai, Bombay, and Rangoon; shovels and spades for Fremantle and the Congo; tools for Ceara, Montreal, Cartagena, Seville, and Bilbao; chisels for Pernambuco; and anvil blocks for Delagoa Bay. A large number of motor ambulances is being built here, and the city's activities in this section of industry includes motor transports, workshops, and kitchens and armoured motor cars, the last-named being particularly urgent orders. It is quite expected that work in this direction is likely now to increase, whilst the war lasts, for the life of an automobile 'at the front' is only placed by the Government at three months. Cutlers are still very busy on work for the allied Governments, while in addition a constant stream of inquiries continues to flow into the city from markets formerly dominated by Germany, and although very many of these are being refused, it really seems possible for more of them to be converted into permanent business if local manufacturers would only tackle the question seriously and place themselves in a position to accept the orders offered."

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MECH. ENGINEERS - June (Kimberley Centre) - - ALL ,,
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ENGINEERING TRADE OF SOUTH AFRICA.

German Competition—The Share of the United Kingdom—How to Increase It.

The report for the year 1913 on the trade of the Union of South Africa by His Majesty's Trade Commissioner has just been issued by the Board of Trade. The following is a summary of portions of it as are of interest to the engineering and manufacturer and contractor :—

General Trading Position.—During the past six years the actual excess of exports over imports amounted to £143,486,000. For 1913 itself there was a trade balance of £28,713,000. Out of this sum the country is well able to meet its obligations in respect of borrowed capital and other charges which include public debt, municipal borrowings, mining and industrial undertakings, financial corporations of all kinds, the purchase of Government stores, the excess of imports over exports in respect of specie, freight charges, etc. Trading during 1913 reached the highest point yet attained. The total trade of the country increased by an amount of £39,741,000, or an advance of 57 per cent in a period of five years. This astonishing rise comprises an increase of £17,314,000, or 68 per cent., in import trade, and of £22,427,000, or 50.7 per cent., in export trade. The following comparative figures show the expanding nature of the market for goods of interest to the electrical and allied trades:

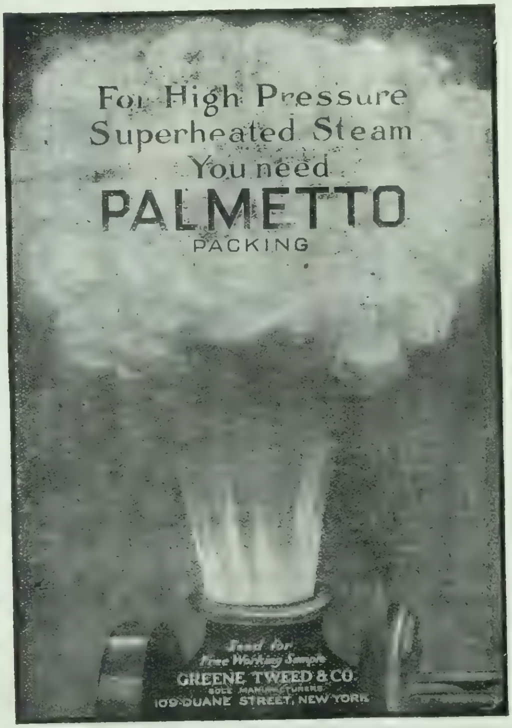
	1908.	1912.	1913.
	£	£	£
Mining material	1,607,000	1.692.000	1,800.000
Electrical material ...	178.000	917.000	931.000
Miscellaneous machinery and requisites therefor ...	1.052.000	1.757.000	1.950.000
Building and constructional material	1,031,000	1.911.000	2.170.000
Requirements for other local industries	2.290.000	4 219 000	4.324.000

In view of the severity of the drought, combined with the dislocation of trade and loss to industry caused by labour troubles, the advances shown in 1913 over 1912 are remarkable. One fact which is not the least important in discussing the recent growth of South Africa's trade, and in contemplating its future potentialities as a market for British goods is that the native is steadily emerging and acquiring habits of civilisation and industry. A close examination of the trade returns for successive years reveals the fact that this great expansion synchronise exactly with the consummation of the political union of the four Colonies, a circumstance which suggests that the notable change in the constitutional arrangements of the country and the consolidation of its financial and economic interests inspired the community and the Overseas investing public with greater confidence, which awakened a new spirit of enterprise and industrial development in South Africa.

Electrical Material.—In the total imports of this class there has been a slight net increase, amounting to £66,000. This amount is made up by an increase in cables and wires of £74,700, and in electrical machinery of £16,200. Against these figures must be set a decrease of £25,600 in fittings and posts. The following table of imports of electrical goods shows what an immense demand for this line has existed in South Africa during recent years :—

	£		£
1908	478,000	1911	1,031,000
1909	632,000	1912	917,000
1910	1,429,000	1913	984,000

In other words, the imports since 1908 amounted to nearly 5½ million pounds sterling. Of the total value of the above imports for the last six years, Germany enjoyed no less than 44.9 per cent. of the trade. It has recently been brought to my notice that a great deal of German electrical plant, bought and delivered in the years 1910 and 1911, could not be put into operation until the end of 1913, owing to the fact that the necessary supply of motive power was not available. I am informed, further, that latterly trouble with some of the foreign-made plant has occurred to an alarming extent, and that the faults are due not only to an over-rating by the makers of the capacities of the various machines, but, in some cases, to bad design and manufacture. One of the most prominent electrical engineers of the Witwatersrand, who has had great experience with plants of all competing countries, has stated to me his opinion that "at the present time, I believe, we have one or two firms in England who can hold their own with any of the Continental houses, and, since we have agreed that quality and not price shall be our first consideration in placing orders, we have not had nearly so much trouble." There is no doubt that British trade has made great advances in the production of larger



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electrical power units during recent years, though there is room for still further improvement. The keenness of foreign manufacturers makes a progressive policy imperative if we are to hold our own in this branch of trade.

Miscellaneous Machinery, etc.—The only items of importance showing a decline are: "Machinery" (not elsewhere mentioned), the imports of which fell by £26.700; anti-friction grease, £7,100; and tools, £8,700. On the other hand, the following increases occurred, viz.: Pumps, £14,000; traction engines, £10,000; power lorries, £18,700; tramway material, £38.000; railway material (not for Government), £79.000; bands and belting, £7,800; lubricating oils, £11,400; steam suction and conveying hose, £8.800; and iron and steel piping and fittings, £49.200. The last item is one to which British manufacturers must continue to give very close attention. A comparison, by countries of origin, of the imports of pipes and fittings into the South African Union since 1910, discloses the fact that while we still remain the principal suppliers of iron and steel piping, our relative position as a competitor has suffered to the extent of practically 10 per cent., due to the increased activity of Germany and the United States.

Constructional Material.—With the exception of corrugated galvanised iron, and linseed oils, paints and colours, there has been a sensible expansion all round, e.g., rises of £23.000 in cranes, elevators and lifts £21.400 in angle iron, girders, etc., and £10,600 in cement. The output of a local concern producing a high grade cement has materially affected the position of Oversea-made cement in the Transvaal Province. A second factory (an offshoot of a British company) is being erected in the Orange Free State, which will be able to compete with the imported article in almost any part of the Union. The imports of cement from Oversea are likely therefore in the course of time to disappear almost entirely from the trade returns of the country.

United Kingdom's Share in General Trade.—Comparing 1913 with 1912, the value of imports from the United Kingdom increased by £119.000, in spite of adverse circumstances, whilst our relative percental position dropped to 54.6 from 58.03, a decline of 3.43 per cent. Comparing 1912 (when our position was a satisfactory one) with 1908 our imports show an increase in value of £7.538.000, and our relative percentage is 1.84 up. The fall in our percentage in 1913, which, of course, implies weakened comparative standing, is not as bad as appears on the surface. The causes producing this loss of ground are temporary, but 1914 will probably again be less favourable for British trade in South Africa; however, I am none the less confident that our relative position will, later on, return to the place it occupied in 1912, with reasonable prospects of further expansion. Our chief competitors in the South African market are the United States and Germany, with Holland, Belgium and France in the second rank, while Italy, Austria, Switzerland, Sweden, Norway and Japan are also growing competitors in certain directions. Amongst items in which the United Kingdom does the major portion of the trade, but encounters keen or growing competition, may be mentioned:—Mining machinery, iron and steel piping, manufacturing machinery, electric fittings and posts, pumps, cranes, elevators and lifts (all from U.S.A. and Germany); bands and belting, tramway rolling stock (from U.S.A.); telegraph and telephone material (from Sweden); sheet iron and steel girders, beams and columns, and iron and steel fastenings (from U.S.A., Germany and Belgium). Furthermore, electrical machinery, tramway and railway rails, lamps, are items in which the United Kingdom is actually behind her competitors (viz., Germany and the United States), and should increase her relative shares of the trade.

How to Increase It.—There is no doubt that the vigour of foreign competition arising from the steady expansion of industries in other countries, as well as the growth of nascent industries in the Union itself, is making the task of maintaining our position a more difficult one from year to year. This pressure calls for a more active policy on the part of British manufacturers in perfecting their selling arrangements in this market. An active selling agent, or direct representative, not only of necessity extends the business of his principals, but his daily contact with the requirements of a market, and his acquired knowledge as to the methods and doings of his competitors, together contribute to keep his home principals alive and progressive. Seeing that the centre of gravity of this market has to a great extent shifted from London to South Africa, I regard the proper selection and appointment of agents as one of the most vital necessities for strengthening the forces of British trade in its struggle against foreign competition.

MINING MEN AND MATTERS.

On Wednesday H.E. the Governor-General paid a visit to the S.A. School of Mines and inspected the various departments with great interest.

* * * *

Mr. J. H. Rider, who has been consulting electrical and mechanical engineer to the Central Mining and Investment Corporation for the past four and a quarter years, severs his connection with the Corner House, in order to join the well-known firm of consulting engineers, Messrs. Preece, Cardew & Snell, of 8, Queen Anne's Gate, Westminster, London.

* * * *

During the week Lord and Lady Buxton have been obtaining an insight into the conditions of life and work on the mines. On Sunday a Kaffir war dance was arranged in their honour, and on Monday they were taken down the South Rand shaft to the 16th level. Mr. Samuel Evans, the Chairman and Managing Director of the Crown Mines, accompanied the party and had each phase of mining explained to Their Excellencies. The distinguished visitors were entertained by the manager, Mr. Warriner, and in the afternoon they toured the surface works and saw the month's output being smelted.

Randfontein Estates.

The Secretary of the Randfontein Estates Gold Mining Company, Ltd., writes: "The boards of directors of the Randfontein Estates G.M. Co., Witwatersrand, Ltd., and Randfontein Central G.M. Co., Ltd., inform shareholders that they deem it of paramount importance to conserve the finances of the company, in view of the present unsettled state of affairs arising out of the great war in Europe and the rebellion in South Africa, and have, therefore, decided to pass the dividend in respect of the year 1914. Whereas in normal times a substantial influx of native labour could with certainty have been looked for in recent months, the rebellion has exercised a detrimental influence, and actually our complement has been completed, though arrangements had been made for a considerable increase. As machines cannot be used to advantage at Randfontein, the adverse effects of shortage of native hand-drillers is obvious. Considerably larger outlays than usual had to be made to secure the mines as regards stores, the normal supplies of which were interrupted by the sudden outbreak of war. Every effort is being made to ensure that the operations of the Randfontein Central Company shall be on as complete a scale as possible, commensurate with its enormous area and possibilities, and it is hoped that shareholders will recognise that the interruption of dividends is but temporary and dictated by uncontrollable circumstances.

Commerce and Industries.

German Contracts.

A correspondent of the *Financial Times*, writing with reference to the Trading with the Enemy Act (1914) Amendment Bill, says: "Although attention has been drawn to the necessity of embodying clauses dealing with the question of existing contracts with the enemy, I do not think that it is widely realised that this is a point of immense importance. To my knowledge there are contracts of national importance which may be held up almost indefinitely unless proper covering clauses terminating these continuing contracts with German firms are embodied in the present Bill. To allow contracts to continue to be held up in this way will (failing such remedy) bring about untold inconvenience and confusion and be entirely against public interest. Incidentally, also, if these contracts can be now placed with English companies it will mean, besides bringing money into the pockets of English firms, very considerable employment of labour.—T. W. Cole, Moorgate Court, E.C." We wonder whether these contracts relate to machinery for an electric supply station?

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Important Company Law Change.

Section 9 of the Trading with the Enemy Act, 1914, applying to the United Kingdom, is of great importance to company promoters, registration agents and solicitors, and to private individuals who propose converting their businesses into companies. Henceforth, until the end of the war, as far as the United Kingdom is concerned, the Registrar will not issue a certificate of incorporation to any new company (except as below mentioned) unless a statutory declaration is filed in the following form

> I of do solemnly and sincerely declare that I am a solicitor of the Supreme Court engaged in the formation of the Company Limited and that the company is not formed for the purpose or with the intention of acquiring the whole or any part of the undertaking for a person, firm or company the books and documents of which are liable to inspection under sub-section (2) of section 2 of the Trading with the Enemy Act, 1914. And I make this solemn declaration conscientiously believing the same to be true and by virtue of the provisions of the Statutory Declarations Act, 1835.

This declaration must be made before a commissioner for oaths, and it will be observed that it must be made by a solicitor engaged in the formation of the company (in Scotland by an enrolled law agent similarly engaged). In this respect it differs from the declaration of compliance required by section 17 (2) of the Companies (Consolidation) Act, which must be made

> by a solicitor of the High Court (and in Scotland by an enrolled law agent) engaged in the formation of the company or by a person named in the articles as a director or secretary of the company.

Thus the Companies Act makes it possible for a business to be converted into a company by its principals, or by a registration agent, without the intervention of a solicitor. The Trading with the Enemy Act appears to do away with this possibility, for there must be a solicitor "engaged in the formation of the company." Of course, there may be differences of opinion as to what constitutes being "engaged in the formation of the company," but probably no solicitor will take the grave responsibility of making a statutory declaration that a company is not formed for a certain purpose or with a certain intention (a very different thing from the formal declaration that the preliminary requirements of the Consolidation Act have been complied with) unless he has had the whole matter in hand and is conversant with all the facts. If this view be correct, obviously the cheap registration of companies is suspended until after the war. It should be mentioned that a company which files a license from the Board of Trade authorising the acquisition of such an undertaking as above mentioned is exempt from filing the statutory declaration. When a company has filed the declaration, however, it will be unlawful for it (without the license of the Board of Trade) to acquire the whole or part of any such undertaking, and if it does so it will (without prejudice to any other liability) be liable on conviction under the Summary Jurisdiction Acts to a fine not exceeding £100 and every officer of the company who is knowingly a party to the default will be liable to the like fine or to imprisonment, with or without hard labour, for a term not exceeding six months.

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S.A.R. Activity.

The Department of Railways and Harbours announce that the provision of new station buildings at Ladysmith has been authorised, also the re-arrangement of the station yard and the deviation and doubling of the line between Ladysmith and Dumana. In connection with new works in Durban, authority has been given for the dredging of channels from the Esplanade Channel to the foot of Gardiner Street and to the Yacht Club Jetty, and for the erection of jetties at these points. The erection of a new bridge at Alice Street crossing in place of the existing bridge at Prince Edward Street (to be demolished) has also been approved. The following orders for new rolling stock have been placed: The Leeds Forge Co., Ltd.: (a) Six first-class main line coaches and six suburban coaches (to be built in steel); (b) one hundred 80,000 lb. high-sided bogie wagons. The Metropolitan Amalgamated Railway Carriage and Wagon Co.: Six second-class main line coaches (steel). The following new rolling stock has been placed in service during the fortnight ended 5th December, 1914:—Five Class 14a engines, one narrow-gauge engine, one four-wheeled water tank truck, 36 four-wheeled fruit trucks.

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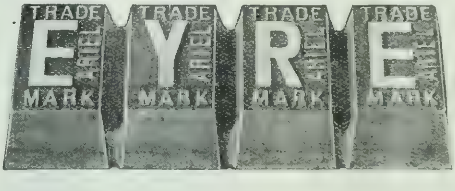
Specially recommended for Bearings of all sorts, Crushers, Locomotive Axle Boxes, etc., Brass, Gun Metal and Phosfor Bronze Castings, Railway Carriage and Wagon Brasses a speciality.



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Trading with the Enemy.

With a view to preventing breaches of the Proclamations regarding trading with the enemy, the Commissioner of Customs and Excise has been authorised to require certificates of origin or declarations of ultimate destination respectively to be presented in respect of all goods, wares, or merchandise imported into or exported from the Union of South Africa in trade with any foreign place in Europe or on the Mediterranean or Black Seas, with the exception of those situated in Russia, Belgium, France, Spain and Portugal. These declarations will consequently be required until further notice in respect of all exports, without regard to value of consignments, to all the foreign places referred to above. For the present, however, certificates of origin will not be required in respect of imports of foodstuffs, of timber of any kind (including pit-props), strawboard, wood pulp, iron ore, granite, ice, tar, or carbide of calcium, or in respect of any imports from places other than those situated in Norway, Sweden, Denmark, Holland, Switzerland and Italy, or in respect of individual consignments not exceeding £25 in value. Any goods, wares or merchandise imported from the above-mentioned foreign places unaccompanied by certificates of origin will be detained by the Commissioner of Customs and Excise until the requisite certificates are produced. The Commissioner is, however, authorised in such cases, and at his discretion, to allow delivery of the goods on the security of a deposit or of a bond to the amount of three times the value of the goods, with a view to the production of the necessary certificates within a prescribed period, provided that he sees no reason for suspecting that the goods emanate from an enemy country. Goods, wares or merchandise sought to be exported to any foreign places in Europe or on the Mediterranean or Black Seas, with the exception of those situated in Russia, Belgium, France, Spain and Portugal, will not be allowed to be shipped until declarations of ultimate destination in the form prescribed have been lodged with the proper Customs authority. Declarations of ultimate destination must be made by the actual exporter, or by some responsible representative of the actual exporter (or, in the case of a limited liability company, by a director, secretary, manager, or other responsible officer) having a personal and first-hand knowledge of the enquiries made, and of the facts stated in the declaration. Carrying agents are not regarded as competent to make the declaration. The following goods will be exempt from these requirements: (a) Goods imported under licence. (b) Goods shipped from European ports to the United Kingdom on or before November 19 and hitherto [illegible]. (c) Goods in respect of which Customs export entries have been accepted before the publication of this notice.

Cassel Cyanide.

The report of the Cassel Cyanide Company, Ltd., for the year ended 30th September, 1914, submitted to the meeting on the 9th ult., states that the net profit for the year amounts to £94,069, to which has to be added the balance from last year of £11,099, making £105,168. The directors propose to transfer to reserve fund £20,000 and to pay a further dividend of 1s. per share (free of income tax), making 2s. per share for the year, together with a bonus of 2s. per share (free of income tax), carrying forward £14,668. The directors recommend the shareholders to deal with the capitalisation of reserves and to pass the necessary special resolutions to authorise a distribution of £88,125, to be satisfied by the issue of one fully-paid share of 5s. for each share held.

* * *

Bechuanaland.

The annual report of the Resident Commissioner of the Bechuanaland Protectorate, issued in mail week, records that the number of cattle sent to the markets of the Union of South Africa during the past year was considerably over 1,000 a month. The chief veterinary work in the Protectorate during the year was the continuation of measures to eradicate contagious bovine pleuro-pneumonia. In 1913 there were 39 fresh outbreaks, all confined to a 50-mile radius round Serowe, and along the Crocodile River strip. The revenue collected in the Protectorate during the year amounted to £65,139, an excess on the previous year of £3,025, which was considerably better than anticipated. The death of a prominent Chief, Simon Hopper, is recorded. This Chief, it will be remembered, gave the Germans in South-West Africa considerable trouble during the war in that territory some years ago.

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Copper Production of the World.

In the accompanying table is given the estimate of the copper production of the world made by Messrs. Henry R. Merton and Company, of London, in accordance with their custom for many years. The total showed a decrease of 19.735 tons, or 1.9 per cent. from the high figure reached in 1912; but a gain of 114.445 tons, or 13.1 per cent. over 1911. The more important gains were in Chile, Russia, Japan, and Africa, the last-named increase being from the Katanga mines. The heaviest loss last year was in Mexico. North America again reports by far the largest production, furnishing about 65 per cent. of the world's supply of copper, as it has for several years.

COPPER PRODUCTION OF THE WORLD.

(In Long Tons.)

	1911.	1912.	1913.
United States	483.865	554.360	548.575
Mexico	60.905	72.455	51.980
Canada	24.950	34.710	34.365
Newfoundland	1,155	540	
Cuba	3.695	4.325	3.365
North America	574.550	666.390	638.285
Argentina	1.020	330	115
Bolivia	1.800	1,850	3.600
Chile	29.595	37.305	39.385
Peru	28.050	26.065	25.310
Venezuela	—	1,340	1,250
South America	60.465	66.890	69.660
Austria	2.440	3.860	3.765
England	100	300	500
Germany	22,010	25.220	24.910
Hungary	85	100	505
Italy	2.600	2.300	1.600
Norway	9,425	10.980	11.610
Russia	25.310	33.010	33.240
Servia	6.885	7.240	6.275
Sweden	2,000	1.500	1.000
Spain and Portugal ...	50.930	58.930	53.835
Turkey	1.000	500	500
Europe	123.085	143.940	137.340
Japan	55.000	65.500	72,000
Australasia	41.840	47.020	46.580
Africa	16.980	16.370	22.510
Totals	871.920	1.006.110	986.375

Transvaal G.M. Estates.

The secretaries write:—"We beg to advise you that the following cablegram has to-day been despatched to the company's London office for publication:—Recent exceptional rains have damaged tramway lines and caused some adits fall in. Month's tonnage and profit will be materially reduced."

The Langlaagte Estate & Gold Mining COMPANY, LIMITED.

(Incorporated in the Transvaal).

Declaration of Dividend No. 49.

NOTICE is hereby given that the Directors of this Company have declared a Final Dividend of Five per cent. (making a total of 10% for the year), payable to Shareholders registered on the 31st December, 1914.

Dividend Warrants will be posted to South African Shareholders from the Head Transfer Office, P.O. Box 1040, Johannesburg, and to European Shareholders from the London Transfer Agency, 30 31, St. Swithin's Lane, London, E.C., on or about the 10th February, 1915.

Dividend on Bearer Shares----Coupon No. 38.

Holders of Share Warrants to Bearer are hereby notified that they will receive payment of the Dividend on presentation of Coupon No. 38, which is payable at the London Transfer Agency, as above, or negotiable with their Paris Correspondents, "James Clark," 46, Rue de Provence, Paris, on or about 10th February, 1915.

Coupons must be left four clear days for examination.

The Transfer Books will be closed from the 1st to the 7th January, 1915, both days inclusive.

By Order,

J. H. TILEY,
Transfer Secretary.

Head Transfer Office,
Box 1040, Johannesburg.
24th December, 1914.

41858

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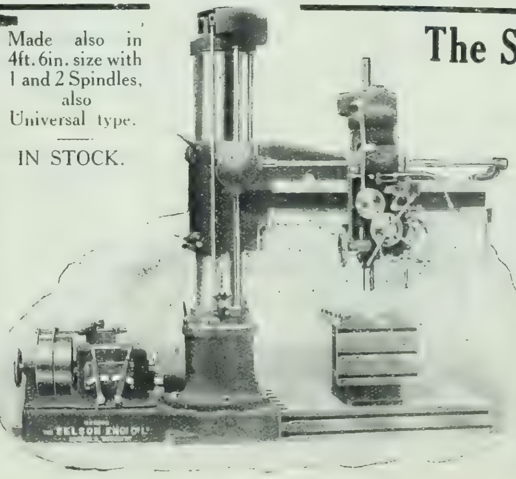

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South African Mines, Commerce and Industries.

ESTABLISHED 1891.

VOL. XXIV., PART I.] JANUARY 9, 1915, [No. 1215.

HEAD OFFICE: 176-180, Stock Exchange Buildings, Fox Street (2nd Floor), Johannesburg, Union of South Africa.

Telephone **913.** P.O. Boxes **963** and **418.**

Cable and Telegraphic Address: **"MINING JOURNAL."**

AGENTS FOR GREAT BRITAIN: Argus Printing and Publishing Co., Ltd., Byron House, 82-85, Fleet Street, London, E.C.

AMERICA: Advertisements accepted from any recognised Advertisement Agency.

ANNUAL SUBSCRIPTION RATES: Oversea, £2; South Africa (by post), £1 10s.; Local Delivery (Town only), £1 6s.

Copies of this journal are obtainable at all Branches and Agencies of the Central News Agency, Ltd., at all News Agents and Railway Bookstalls throughout South Africa, and at the London Agency as above.

NOTICE.—The postage of this issue of the *S.A. Mining Journal* is: South Africa, 1d. All other parts, 1½d.

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Notes and News.

The Crown Mines Dividend.

The interim dividend of 30 per cent., or 3s. per share, declared for the half-year ending December 31, 1914, against 55 per cent., or 5s. 6d. per share, for the second half of 1913, has naturally aroused comment. The dividend, together with the distribution per end June last, makes 85 per cent. for the year. A dividend of 85 per cent. for the year absorbs £799,000, leaving an estimated amount of £411,000, of which profits tax absorbs £110,000; French fiscal taxes, £5,000; donations, £7,000; miners' phthisis compensation, £43,000; capital expenditure, £90,000; undermining rights annuity, £20,000; debenture interest and redemption, £133,000; leaving a debit balance at the end of the year of £85,000, as compared with £88,000 at the end of 1913. The working profit for 1914 has fallen short of expectations, owing to yield of ore per ton having been lower than indicated by the estimated value of the ore reserves mined.

* * * *

Vogelstruis Estates.

The renewal of the Vogelstruis Estates Company's eight-stamp battery will be completed by April next, and when a tube mill has been added the company can then fairly say that its plant and equipment are practically new throughout and up to date, and capable of treating an increased tonnage. When these payments have been met it will be at the end of its extraordinary expenditure, and can then turn resolutely to the extinction of the profit and loss debit. "Judging by what we have done during recent years, unless there is a falling off in the ore grade, we may reasonably hope," observed Mr. John Stein Morrison at the recent meeting, "to accomplish that most desirable object in due time." Another satisfactory feature is that the ore reserves on June 30 last amounted to 245,000 tons—which is 37,443 tons in excess of the reserves of June 30 last year—and as the dead work of these reserves stands at a very conservative figure—about 2s. 3d. per ton—there is every reason to be satisfied on that point.

* * * *

Electric Blasting Troubles.

About a month ago, it will be remembered, an accident which was considered to be unique in the history of electric blasting on the Rand occurred at the City Deep ventilation shaft—a round of holes being fired by a flash of lightning. Two white men and several natives were killed; but the accident was regarded as in the nature of a freak. On Tuesday last, however, the possibilities of lightning playing down the wire ropes of a shaft were again demonstrated, when, for the second time, a round of holes which had been connected up was fired by lightning. A white miner named E. P. Price was severely cut about the head as a result of this blast, and a native was killed. The progress of electric blasting on the Rand is not likely to be furthered by these "untoward events."

* * * *

Kamfersdam Mines.

The report states that during the year ending June 30, 1914, the removal of fallen ground has been completed, and the deposit of blue ground on the floors continued. Washing of mixed ground as hauled from the mine, and a certain quantity of the floored blue ground, has resulted in a yield of diamonds of the value of £8,426. In August, 1914, when everything was in order for the regular flooring and washing of blue ground, the war broke out, and it was deemed advisable to cease operations and close down the mine. Mr. H. J. Krauss, the managing director, arrived at the mine in November last year, and actively superintended operations until the mine was closed down. He has now returned to England, and at the meeting of shareholders will give his views as to the present position and future prospects of the mine. The profit and loss account for the year shows an adverse balance of £20,537, increasing the total debit balance to £164,962.

Position of Luipaardsvlei Estate.

The report of the Luipaardsvlei Estate and Gold Mining Company, Ltd., for the year ended 30th June, 1914, presented at the meeting on the 23rd ult., states that the net profit is £32,249 (as against £29,949 for the previous year), and this amount, added to the sum already standing to the credit of profit and loss account, increases it to £135,086. In compliance with the recommendation of the general manager, the sum written off for depreciation is £12,206, leaving a balance of £122,880, which is carried forward. As stated in previous reports this credit to profit and loss account is largely represented by the additions which, during the last few years, have been made to the general equipment of the mine and to the property, and to that extent is not in a liquid form. It was the intention of the Board, as stated in the circular issued 1st July last, to recommend to shareholders the declaration of a dividend. In view, however, of the war, and the fact that military operations are proceeding in South Africa, the directors feel that it would be against the best interests of the company to reduce at the present moment the available cash resources and to endanger thereby the sound and promising position which the company has now reached. As soon, however, as the general position shall, in their opinion, justify such action, the board proposes to declare an interim dividend out of the current year's profits. The debenture debt has been reduced during the year by £8,445, and at the date of the accounts stood at £87,555. It has since been further reduced to £83,745.

* * * *

Cyanide Supply.

The steps taken to maintain cyanide supplies from other than German sources have been such as to render the position secure. This is evidenced by the remarks of Mr. D. S. Carson, who presided at the annual meeting in Scotland of the Cassel Cyanide Company on the 9th ult. This concern, it will be remembered, is the largest supplier in Great Britain of cyanide. Mr. Carson said that since the war began all departments of the company had been working at high pressure. Their manufacturing and financial resources had enabled them to overtake an important shortage of cyanide on the Rand, thus preventing a curtailment of South African mining operations and a serious decrease in the gold available for the Bank of England and the prosecution of the war. Now more than enough cyanide was being manufactured in Britain to meet the demands of the Empire.

* * * *

Gold Mines Investment.

The companies in which the Gold Mines Investment has placed its funds are very similar to those in which the Consolidated Gold Fields of South Africa is interested. The latter company, however, was not affected by the war; the Gold Mines Investment financial year, which ended on the 30th ult., includes four months of it, which doubtless affected the position. To what extent, however, it is impossible to say, seeing that where quoted securities are concerned prices are taken as at July 27 last. The extent of the depreciation will be seen from the annexed comparison:—

	1911.	1912.	1913.	1914.
Investments at book cost	£709,835	£685,905	£709,326	£736,107
Market value	620,130	479,870	404,374	403,167
Quoted securities ...	489,902	392,397	293,477	301,067
Unquoted securities...	130,228	87,473	110,897	102,100
Depreciation	89,700	206,000	304,000	332,940
Depreciation, p.c. ...	12·5	30	42·8	45·5

During the twelve months ended November 30 last the company invested £26,781, raising the total of its investments to £736,107. Contrary to expectations entertained twelve months ago, the directors are now of opinion that the depreciation is, in the main, of a permanent character, for of the total of £332,940 they write off permanently £271,845, leaving a balance of £61,095 to rank against profits. The amount written off is provided by utilising the reserve fund of £125,000 and the profit and loss balance twelve months ago of £146,845. Hitherto the directors, in order to avoid altering the form of the accounts, have not written off depreciation, having regarded it as temporary, and therefore as likely to be recovered. This is the reason that so heavy a percentage as 45·5 is shown in the 1914 column. The subjoined figures show how the revenue of the company has diminished within the past four years, mainly, of course, on account of the inactivity in the share market, the directors being prevented from realising investments at a profit:—

	1911.	1912.	1913.	1914.
Total revenue	£71,354	£58,378	£27,138	£26,804
Profit and loss balance	60,033	49,185	19,979	20,488
Contingent liabilities..	25,441	5,465	5,238	12,963

It would appear, however, that certain shares during the latest period were disposed of to advantage. The list of investments has not altered to any material extent, but the directors have invested in Shamva Mines—shares which they doubtless picked up at a bargain price.

* * * *

Daggafontein Prospects.

The report of the Daggafontein Gold Mining Company, Ltd., for the year ended June 30 last states that sinking of the No. 1 shaft was continued during the year, and on September 7 the footwall of the Main Reef was passed through at a depth of 3,580 ft. Samples of the reef taken all round the shaft give an average of 7·851 dwts. over an actual stoping width of 40·363 ins. At the annual general meeting held recently, Mr. Roger C. Richards observed that since the close of the accounts the Main Reef had been struck in the shaft, giving assays which represented about 32s. per ton. They were informed by the consulting engineer that the reef in the shaft had an average dip of 5 degrees to the west, and, generally speaking, the appearance of the section exposed in the shaft had a great similarity to those exposed in the Springs Mines in the area of the northern shaft. The shaft on Daggafontein was in a more easterly position than any other on the Rand. The accounts of the Daggafontein Prospecting Syndicate, Ltd., show an actual loss for the year to June 30 last of £239, which is increased to £2,239, after setting aside £2,000 against depreciation in investments. The balance at credit of profit and loss is thereby reduced to £793. In view of the existing state of affairs due to the war, the directors deem it prudent, in addition to the provision referred to, to write down substantially certain share assets from the figures at which they stood in the Syndicate's books. They have therefore utilised £45,000 standing to the credit of share premium account.

* * * *

Frank Smith Diamonds.

The report of Frank Smith Diamonds for the year to June 30 last states that the new gear and washing plant commenced operations in June, 1913. It soon became apparent that alterations and adjustments in the machinery were necessary. These alterations were effected, but did not entirely remove the causes of the frequent stoppages. Based on the valuations of the diamonds the loss on working during the year (after allowing for sundry revenue) has amounted to £7,277, nearly the whole of which was incurred during the first six months. During the second six months, and more especially in July, the value of diamonds found nearly covered the cost of production. The loss of £17,507 shown in the balance sheet is arrived at by adding to the above sum an amount of £8,728 written off under the heading of depreciation, and £1,502 written off under the heading of development and incline shaft. The results obtained by Mr. Piasecki in June and July gave every reason to hope that a further comparatively small capital expenditure would have enabled the company to begin making regular profits. The fact that at the end of July a provisional agreement was concluded between the large diamond producers for the future joint handling of their diamond production, was considered likely to result in a steady improvement in the market for diamonds. It was at this stage that the outbreak of war put a stop to further operations, and necessitated the closing down of the mine. The state of the diamond market during the first half of the current year was such, that only a portion of the production could be marketed, but the valuations made in South Africa have been confirmed, within a small margin, by a subsequent valuation effected in London. In order to provide funds for working expenses it has been neecssary to obtain advances on the stock of diamonds in hand, and against the company's assets generally. As the articles of association limit the borrowing powers of the directors to one quarter of the issued capital, it is necessary in order to cover the entire transactions, to extend the borrowing powers of the directors, and it is recommended that they should be increased to £100,000.

* * * *

Sheba Gold.

The drop in the profit of the Sheba for the twelve months ended with June last of £5,983, to £49,549, is in part due to a shrinkage in the yield of 2s. 7d. per ton, to 43s. 8½d. The ore crushed was practically of the same grade as in the preceding year, but, owing to its refractory character, the extraction was not so good; hence the smaller recovery per ton. Working costs (exclusive of development) were 1½d. per ton less at 23s. 10d., but the amount spent upon development averages 6s. per ton, or 9d. per ton more. Despite the larger expenditure on development, the ore reserves have further fallen 8,500 tons, to 101,500 tons. The quantity of Zwartzkopje ore, averaging from 12 to 15 dwts. per ton, has decreased from 70,000 tons to 30,000 tons. The remainder of the reserves are valued at from 7 dwts. to 10 dwts. per ton.

* * * *

Moodie's Gold Mining Accounts.

The directors of Moodie's Gold Mining and Exploration Co., Ltd., announce that the chairman (Mr. E. W. Cox-Moore) paid a visit to South Africa during the past half-year, for the purpose of looking into the affairs of the company on the spot. During his stay the chairman inaugurated various measures of administrative reform, which, in the opinion of the board, will be advantageous to the company. The annual accounts have hitherto been made up to March 31 in each year and submitted to shareholders in September. It was decided, prior to the chairman's departure from England, to bring the accounts up to September 30, 1914, and to hold the annual general meeting before December 31 in this year. It has, however, been found impossible to complete the accounts within the time specified, and the accounts to September 30, 1914, will be submitted in the early part of the new year, when the annual general meeting will be convened.

* * * *

Balkis.

The report of Balkis, Ltd., submitted to the meeting on the 3rd ult., covers the year ended 31st August, 1914, and states that the net profit for the period under review amounts to £780, which, added to the sum of £760 brought forward, gives £1,541 to be carried forward. After deducting the book value of one farm sold during the year and adding expenditure on fencing and registration of titles, the "property account" stands at £73,602, against £73,764 last year. All the lands of the company in the Transvaal are now registered at Pretoria in the name of Balkis, Ltd. During the year very few opportunities have presented themselves for the profitable realisation of the company's sundry investments. As in previous years, these are taken in the balance sheet at or under cost price. One farm situated in the Zoutpansberg has been sold at a fair profit, and it is hoped that the establishment of a European engaged in farming in that district will encourage settlements on the adjacent lands. The Board are unable to report any considerable interest in prospecting during the year under review. Owing to the stagnation prevailing in the mining markets prospectors were unwilling to incur the expense of expeditions into the Northern Transvaal. Some prospecting has, however, been carried on in one of the southernmost Waterberg farms and in the Bangwaketsi territory, but no results of any value have yet been reported.

TOPICS OF THE WEEK.

DIVIDENDS FOR 1914.

THERE is little to add to the dividend list printed in our last issue or to our comments thereon. It may be put on record, however, that the dividends for 1914 amounted to: Gold, Witwatersrand, £7,763,756; gold, outside, £307,517; diamonds, £139,800; coal, £180,208; tin, £49,500; total, £8,440,781. The returns reveal an all-round decrease in the distributable profits as the result of mining operations, when compared with the corresponding totals for the year 1913. Mining dividends have decreased by a total of £893,252; gold, Rand, £430,340; outside, £767,737; diamonds, £275,200; coal, £43,475; tin, £67,000. In 1913 the Randfontein Central paid 10 per cent., which absorbed £419,370, but as was explained in the official notice from the company, the directors have decided this year to conserve the substantial profits earned during the past year. This accounts for the shrinkage in the distributions of the Rand gold mining companies. The only new name in the list is the Geduld Proprietary Mines, which have declared a first dividend of 5 per cent., representing a distribution of £41,875. The eclipse of the diamond industry is reflected in the Premier dividends. Whereas in 1913 holders of preference shares received 250 per cent., equal to £100,000, for 1914 the amount allocated to them was £50,000, or 125 per cent., while deferred shares obtained a single distribution of 200 per cent., absorbing £80,000, as compared with 750 per cent. and £300,000 in the previous year. Apart from the Randfontein and Crown Mines declarations, it will be seen that the profit distributions are, on the whole, excellent. As the Rand output for December will not be announced till to-day, we must postpone till next week a comparison of the complete results of 1914 with those of the preceding year.

THE CHARTERED COMPANY.

ELSEWHERE in this issue we print a summary of the report of the Chartered Company. It will be seen that the report discloses greater activity on the part of the Company in developing the resources of Rhodesia on the policy laid down in a report of Mr. Birchenough made in November, 1912. That gentleman then set out that the object of the Company in taking up large areas of land for stock breeding, tobacco raising, and other forms of agriculture was in order to make money for the shareholders. Two years ago the Company owned very few cattle; to-day ranching on a very considerable scale has been effected and is rapidly being extended. The general administrative revenue and expenditure, as far, at least, as Southern Rhodesia is concerned, more nearly balance one another than previously. Taking the accounts for the twelve months ended March 31, 1913, the expenditure in excess of revenue was only £889, while in Northern Rhodesia it was £51,708. For the twelve months ended March 31 last Southern Rhodesia showed an excess of revenue over expenditure of £17,135. As regards Northern Rhodesia, there was an excess expenditure of £48,177, showing a slight improvement over the preceding period. When we look at the company's commercial revenue we find evidence of distinct progress. The figures may not be large, but it is necessary to bear in mind the difficulties which exist in Rhodesia, and which, consequently, make progress slower than would be the case in a better-settled country. In the following statement, which does not include net receipts from land sales, a very substantial improvement is shown when the figures for the twelve months ended with March 31 last are contrasted with those of 1911-12:—

	1911-12.	1912-13.	1913-14.
Company's revenue	£255,808	£296,068	£360,425
Company's expenditure ...	185,974	209,286	274,290
Revenue in excess of expenditure	£69,834	£86,782	£86,135

Expenditure has grown in proportion, but this cannot be avoided. If the company is to benefit in a commercial sense it must be prepared to make liberal outlays in various directions. The report speaks of different branches of agriculture which the management is fostering, and shareholders will doubtless agree with the management that in time these different undertakings should prove of great importance. Signs of prosperity of a country can be obtained from the number of inhabitants. Although in Rhodesia the white population increases very slowly, it was estimated in Southern Rhodesia at March 31 last at 30,000 and in Northern Rhodesia at 2,250. The native population totalled 712,783 in Southern Rhodesia and 875,000 in Northern Rhodesia. The drag on the company at present is Northern Rhodesia, but this latter territory must be developed if it is to prove of that value to the Chartered Company which it is expected to be. An indication of general progress can be gathered from the following figures of imports and exports, exclusive of specie and re-exports:—

Year.		Imports.	Exports.
1911	... ...	£3,932,290	£2,850,762
1912	... ...	4,039,988	2,975,100
1913	... ...	4,340,505	3,297,099

Land settlement is proceeding on satisfactory lines, and it is worthy of note that prices of land sold under permit of occupation have risen—6s. 4d. per acre in the 1913-14 report, against 4s. 2d. per acre in 1912-13. Smaller farms seem to have been in favour, which, perhaps, is a good sign. The tobacco industry has progressed so rapidly that it has outrun the local demand. There should surely be an opportunity for disposing of it in Europe in present circumstances. Mining continues to yield greater returns, and railway receipts are very encouraging. It is noteworthy that the aggregate value of the mineral production of Southern Rhodesia for the year ended 31st December, 1913, showed an advance of £188,206 over the record figures for 1912. The value of the gold production for the first ten months of the current year was £2,958,827, as compared with £2,903,268 for the whole of 1913. It is estimated that the value of the gold output for this year will exceed that for 1913 by about £750,000. The value of the mineral output of Southern Rhodesia for 1914 is estimated at about £4,000,000. The concluding portion of the report is distinctly encouraging. " While it is impossible," it says, " to predict at the present time to what extent the conditions created by the war will delay the realisation of the directors' aims, they consider that the disturbance of the company's operations in certain directions and the financial loss to which it will be exposed mainly through shrinkage in the capital value of its investments, are not likely, so far as at present can be foreseen, to do more than retard the fulfilment of their hopes. So far as the company's resources are concerned, they remain ample for its present requirements, and, at the valuations of 30th July last show little change from the figures appearing in the balance sheet at 31st March, 1914. It is anticipated that it will be possible to provide for all current requirements out of income throughout next year."

PERSISTENCE OF ORE IN DEPTH.

Mr. T. A. Rickard's paper on the " Persistence of Ore in Depth " read recently before the Institution of Mining and Metallurgy, has aroused a very interesting controversy. In introducing his paper, Mr. Richard said:—" The enrichment of ore in depth has been consigned to the limbo of discarded fallacies; the generalization that ore persists indefinitely in depth must join it. Geologists may prove to their satisfaction that the deepest mine workings are relatively shallow and that the question of depth in itself is rendered supererogatory by the miles of erosion to which the ore-bearing rocks have been subjected. But such academic arguments are only confusing. . . . Then I turn to the share-list of mines quoted on the London Stock Exchange at the date when my first article on this subject was published, namely, January 21, 1893, nearly 22 years ago. In the *Financial Times* of that day I find a list of the mines that were then the subject of joint-stock speculation. Out of 250 companies then quoted, only a quarter have survived. Out of 22 British mines, only 7 have been continuously operated, and each one of these has gone through phases of reconstruction and re-capitalization; 15 are dead as mutton. Out of the 76 South African mines, 30 have succumbed, chiefly diamond ventures and gold enterprises on the outskirts of the Rand. As the Rand is practically one lode, the discontinuance of an individual mine is inconclusive. To talk about persistence in depth in such a context is like asseverating physical immortality to the compiler of a biographical dictionary." Naturally not all the contributions to the interesting discussion that followed were in accord with Mr. Rickard. Thus, Professor William Frecheville said in the main he thought many of the members would agree with the author, but at the same time he could not help thinking that in his keenness to prove his point the author had at times given a rather one-sided view. For instance, he quoted the Village Deep as an instance of a mine where the ground in depth was poorer than the ground immediately above it. That was quite true, but the author omitted to mention a neighbouring mine, the City Deep, where the exact opposite was the case. The task of comparing ore ground in depth with ore ground close to the surface was a very difficult one, because they all knew that ore deposits were patchy. Even the ore deposits on the Rand were patchy, and they were much more so in ordinary lodes. Most people would probably agree with the author that too little lateral prospecting was done as a rule. In ground which was highly mineralied the chances of finding other parallel deposits, or other deposits on the extension, were probably not always sufficiently realized. In conclusion, in spite of what the author had brought forward, he thought that miners would continue, when they had encouragement, to sink, in the hope that they might find a recurrence of good values, or other ore bodies, such as those to which the author had drawn attention in the North Star and other mines. Mr. E. T. McCarthy said the subject was of the highest importance, although one that was open to a great deal of criticism, because the factors concerned in it were so various, so complex, so overlapping and so interwoven with each other, that it was difficult to draw any certain deductions from them. Yet the author had made out a very strong case in support of his contention by the facts he had marshalled in favour of the question of persistence of ore in depth. Considering again the limited number of mines which had been carried to any appreciable depth, he maintained and repeated that one must be extremely cautious in arriving at anything like a definite conclusion. Going back thirty years, he considered that the probability of most of the mines now quoted going down to the depth they had since attained was at that time improbable, not so much on account of any doubt then entertained as to the persistence of ore in depth as that the depths now reached were then looked upon as impracticable. As the author stated, the question was a comparative one. He believed that the depths of veins, or of a series of lens-like fissures, had some relation to the length, strength, and structure found along their strike, or lateral extension at or near surface. For example, if he found the outcrop of a vein continuing all round the globe, only then would he expect it to go down indefinitely in depth, or until it ended at the centre of gravity. In a sense, therefore, it would be seen that he was thoroughly in accord with the author's statement that there was a general tendency to non-persistence of ore in depth. But he made the distinction that that general deduction of non-persistence of ore in depth had nothing to do with the actual depths itself, but only apparently so, because of the known mines practically all had been sunk on veins and deposits followed down from or near surface. Among the other contributors to the discussion were Messrs. C. Baring Horwood, F. P. Mennel, J. S. Olver, Dr. J. Malcolm Maclaren, Dr. Cullis and Mr. W. McDermott, whose views we hope to quote in our next issue.

IMPROVING POSITION OF SPRINGS MINES.

Better Development Results—Financial Position—Valuable Debenture Privileges.

Development at the Springs Mines continues to show a continued improvement with the result that little difficulty may be anticipated in raising the further capital required to bring the mine to the producing stage. It may be remembered that at the last annual meeting the Chairman, Mr. W. L. Honnold, stated that the cash in hand would probably suffice to finance operations up to the end of the first quarter of this year, and doubtless that anticipation will be realized. In regard to the finances it may be mentioned that the authorised capital is £795,000, in 795,000 shares of £1 each; 630,000 shares are issued and fully paid, including vendors'. In April, 1909, 330,000 shares were guaranteed at 30s. each by the Consolidated Mines Selection Co., Ltd., for working capital, and offered to shareholders of the Transvaal Coal Trust, Ltd., for subscription at same price. The directors have power to increase the capital to £1,000,000. There are £315,000 six per cent. first mortgage debentures to bearer in bonds of £5, £10, £20 and £100 each offered to the shareholders and to those of the Transvaal Coal Trust Co., Ltd., in April, 1913, at 97½ per cent. and redeemable at par in ten annual drawings commencing 1918, the company reserving the right to redeem the whole or part at any time at 105 per cent. on six months' notice and also the right to purchase in the open market at any time at or under 105 per cent. Interest is payable April 1st and October 1st. Allottees received option bearer certificates entitling them during three years from May 2nd, 1913, to subscribe at par for one share for each £1 of debentures allotted. The issue was underwritten for a commission of five per cent.

LANCASTER WEST IN LIQUIDATION.

The War Precludes Possibility of Raising Fresh Capital—Heavy Debenture Charges—History of the Company.

On Tuesday last, in the Rand High Court, in the case of the application of the Lancaster West Gold Mining Co., it was ordered that a provisional order of liquidation be granted the company, and that a rule nisi be granted calling upon the company to show cause to the Court on January 19, 1915, why the company should not be finally wound up. And so closes another chapter in the history of the ill-fated Lancaster Mines. The history of the property is not without interest. It was registered in the Transvaal on October 8th, 1897, and acquired 144 mining claims and a water right situate west of the Lancaster property farm Luipaardsvlei No. 8, Krugersdorp district, West Rand, Transvaal. The consideration was £120,000 in fully-paid shares. Crushing commenced in May, 1899, with 40 stamps and cyanide works; in July, 1908, 30 stamps were leased from the Lancaster Gold Mining Co., Ltd., making 70 stamps. In August, 1909, the capital was reorganised and the undertaking of the Lancaster Gold Mining Co., Ltd., acquired, also 142·6 claims adjoining. The total area now held is 582 mining claims, also two claims north of the outcrop and water-rights, all situate on the farm Luipaardsvlei No. 8, Krugersdorp district, West Rand, Transvaal. There are several series of reefs on the property, the two principal being the Botha and West Battery reefs, and at December 31st, 1912, there were 558 claims unworked on the Botha Reef of which 303 claims were also underlaid by the unworked Battery reef. The crushing plant comprises a 100-stamp mill, 3 tube mills (started June, 1900), and cyanide and slimes plant with a capacity of 260,000 tons yearly. During 1912, 247,390 tons yielded £269,379, or 21s. 9d. per ton; costs (including mine development), 21s. 9d. per ton. Owing to unfavourable results of development work during 1912, and also to the high cost of working compared with the yield and inability to raise further funds to open up the unprospected portion of the property, it was decided in January, 1913, to close down the mine and work ceased on January 11th, 1913. The debenture holders agreed to the suspension of the annual drawings, the company, however, retaining the right to purchase the debentures in the market or otherwise and remaining liable to redeem the whole of the outstanding debentures not later than July 1st, 1919. The ore reserves at date of closing down were estimated at 335,500 tons value 6 dwts. per ton, also 508,000 tons value 3·2 dwts. per ton. The authorised capital is £700,000, in 700,000 shares of £1 each; 590,250 shares are issued and fully paid. The capital, originally £220,000, was increased to £300,000 in 1899. In August, 1909, the capital was reduced from £300,000 (215,000 issued) to £161,250 by cancelling 53,750 shares, shareholders receiving three new for every four shares held; the capital was then increased to £700,000, of which 120,000 shares were issued to the shareholders of the Lancaster Gold Mining Co. as purchase price for the undertaking, and 309,000 shares were issued to A. Goerz & Co., Ltd., 60,000 for 142 claims and 166,000 in satisfaction of the debts of the Lancaster West and Lancaster Gold Co. (aggregating, approximately, £207,500), and 83,000 at 22s. 6d. per share. The 249,000 shares issued to A. Goerz & Co. were then offered to shareholders at 22s. 6d. per share, 120,000 to the Lancaster Gold Co., being three for every ten shares held, and 129,000 to the Lancaster West Co., being three for every five shares held. £195,000 six per cent. first mortgage debentures of £20 and £100 were offered to shareholders in 1899, at 105 per cent., guaranteed by A. Goerz & Co., Ltd., for 5 per cent. commission; interest payable January 2nd and July 1st; redeemable July 1st, 1919, or by purchase in the market or otherwise; £96,220 have been redeemed, leaving £98,780 outstanding. The accounts to December 31st, 1912, submitted in Johannesburg on May 28th, 1913, showed gold receipts £269,379 and a total loss of £54,680 after writing off £46,143 depreciation; this was met by £48,931 credit balance brought forward and £5,749 sundry revenue received during the year. Cash and cash assets (less liabilities), £6,512. Mr. H. Neuhaus, presiding at the Lancaster West meeting in 1913, reviewed the history and position of the property in great detail. *Inter alia*, he said:—

> It is clear from the consulting engineer's report that your directors had no other cearse open to them but to close down the mine. The ore reserves, while still large in quantity, further decreased in value during 1912, so that it was not to be expected that a yield in excess of 20s. 9d. could be obtained. The cash resources of the company were practically exhausted, and it was impossible to raise the money required to reopen the Botha mine in its lower levels, where years ago payable ore had been disclosed, or to prosecute development work in unprospected portions of the property. It was not only that the amount required, namely, a minimum of £30,000, was large, but the level of working costs is at present such as hardly to justify the belief that if this ore were made available and further payable ore were found in its neighbourhood, would could be continued at a profit, while the burden of the debenture issue, needing an annual service of £18,000 until 1919 inclusive, must also not be overlooked. In short, the general outlook at the mine, the development position (and since the amalgamation over £120,000 has been spent on this account), and the fact that during the four months ended 31st December last a loss of £4,797 was made, convinced your directors that it was in

the best interests of all parties concerned to close down operations. But though this grave conclusion was come to, I do not think shareholders need entirely despair of the position. Of course, it is impossible to say what the future will bring, but it is not unreasonable to anticipate that, providing the company can hold out until working conditions on the Rand generally show sufficient improvement, it will then be found possible to raise the necessary capital to resume work, particularly in the Botha section, while it is also not out of the question that in course of time one or other of our neighbours may see its way to make an acceptable bid for the property.

Of course, the war has dashed the hopes held out by Mr. Neuhaus, and in the circumstances liquidation seems to be the only course open.

A NEW BARBERTON PRODUCER.

Details of the Clifford G.M. Co., Ltd.—French Bobs Mine and Plant Resuscitation.

The Clifford G.M. Co., Ltd., is the latest "outside" producer to contemplate active operations. The company owns 177 claims adjoining the property of the French Bobs Mines, Ltd. (in liquidation), in the Barberton district. A considerable amount of development has been done on these claims, and work is being actively carried on. In May last the company purchased the whole of the assets of the French Bobs Mines, Ltd., including the reduction plant and claims. The total holding of the Clifford Company is now 452 claims. The capital has been increased from £3,000 to £20,000. Crushing will commence early this year. In the course of their report, submitted at the annual meeting on December 31st, the directors state: "Mining operations on your claims were resumed in June, and development has been proceeding since then. Other work done during this period consists of the re-arrangement of the French Bobs mill, laying a tramway from your claims to connect with the existing tramway, and fluming the water-race. It is estimated that this work will be completed in January, 1915, when crushing will be commenced. Owing to the war this programme, which would normally have been completed by October last at the latest, has been considerably delayed."

In a report on the Clifford Gold Mine by Mr. J. Tom, dated December 31st, 1914, it is stated, *inter alia*:—

The mine is situated about eight miles from Louws Creek Siding, on the Kaapmuiden-Barberton Railway Line; Louws Creek is 274 miles from Johannesburg and 110 miles from Lourenco Marques.

PLANT.

The plant for the treatment of the Clifford ore has been purchased from the liquidator of the French Bobs Mines, Ltd. The price paid was £3,750, which includes the claims, water-rights, and all the other assets of that company. The plant is one of the finest in the country; it is a fully equipped 20-stamp plant in excellent condition, comprising crusher, 20 stamps of 1,250 lb., Chilian mill, 2 tube mills, a complete slime plant, including a 90-leaf Butters vacuum filter plant, Pachuca tanks, Dorr classifier and slime thickener, etc., a complete electric installation, water-turbine and generator set, for the utilisation of water power from Louws Creek, assay office, a large number of offices, dwellings, etc. In addition there is an excellent aerial gear three-quarters of a mile long, and a large stock of mining material, including trucks and tramway material, stores, etc. As the scheme of working to be adopted does not require certain portions of the reduction plant, advantage has been taken of the opportunity to dispose of the Butters plant, Pachucas and Door classifier. The price realised was £810, thus reducing the purchase price of our plant to £2,940, a very low price to pay for a fully equipped 20-stamp plant. The power formerly employed was obtained from two 150 h.p. Hornsby gas engines. These gave a lot of trouble, and the final closing down of the mine was attributed to the breaking down of the engines. With proper attention and supervision there is no reason why these engines should not work efficiently; fortunately there are enough spares at the mine (some just delivered prior to closing down) to make up one complete engine. This work will be taken in hand at an early date, and the gas engine will act as a stand-by in case of the failure at any time of the water power plant, and later on to supplement the power obtained from that source. It is proposed to work up to 10 stamps by means of water-power derived from Louws Creek. A double-vortex turbine with electric generator were already installed, the only work requiring to be done being the fluming of the water race. It was found necessary to flume the whole of the race, a distance of 8,000 feet, and the work has therefore turned out to be more costly than was at first estimated; it is now practically completed, and its cost will soon be repaid out of the economies to be effected by the use of water-power in the place of gas engines, with their high cost in fuel, supervision and maintenance. The water supply for the mill is obtained from Louws Creek, by way of the water race, and is ample at all seasons of the year.

MINE.

For the present it is proposed to leave the French Bobs Claims out of consideration. There can be no doubt that an examination of these claims and of the workings thereon will disclose ore that can be profitably exploited, but owing to the dangerous state in which these workings have been left, this examination cannot be undertaken just now. On the Clifford claims three reefs have been opened up. *No. 4 Reef.*—This reef was originally sampled in an adit 145 ft. long and in surface trenches. The sampling of the adit proved the existence of an ore-shoot of which 90 ft. was within the boundaries of our claims. The average assay value was 7.6 dwts. over 7.3 ft. Subsequent work on this level has shown that the shoot extends at least a further 25 ft., and has disclosed rich ore in the walls of the adit not included in the sampling, so that a higher value can be anticipated in stoping. An adit driven at the lowest level it is possible to attack with the present position of the tramway delivering the ore to the mill, confirms the value of the ore at the higher level, in spite of the fact that the lower workings are in the sulphide zone. At 230 ft. east of the western boundary an adit cross-cut has intersected two gold bearing zones on the same line of reef; these are 20 ft. apart, and assay 5.1 dwts. over 7.5 ft. and 8.3 dwts. over 7.5 ft. respectively. The work done so far on the latter reef has proved an ore-shoot 50 ft. long, the average assay value of which is 15.2 dwts. over 38 inches. Further evidence of the value of No. 4 reef along its strike is supplied by the surface trenches, which have exposed the reef in places over a total distance of 1,115 ft. from the western boundary. These trenches have not been excavated with sufficient system to allow of an exact determination of the distribution and value of the ore-shoots along this line, but the fact that gold has been found in every sample, and one assay has been as high as 8.7 dwts. over a width of 8 ft., indicates that the chances of finding further profitable ore-shoots are exceedingly good. *No. 2 Reef.*—The original sampling of the old adit on this reef proved an ore-shoot at that level 30 ft. long, of an average assay value of 7.3 dwts. over 7.3 ft. A winze 58 ft. deep since sunk from the surface to the adit averages 9.5 dwts. over 4 ft., the width of the winze. The average value, calculated from these figures, is 8.4 dwts. over 5.1 ft. *Wild Rose Reef.*—Not sufficient work has been done on this reef to arrive at any definite conclusion as to its value. In a winze from the surface only the upper 35 ft. carry pay-ore, the average for this depth being 6.6 dwts. over 19.7 inches, or 4.3 dwts. over a stoping width of 30 inches. The country here is disturbed, and further work will have to be done before any definite data as to the extent of the ore-shoot will be available.

TRANSPORT OF ORE.

The problem of ore-transport from the mine to the mill presented some difficulties, owing to the fact that the distance in a direct line is about 2½ miles, with a vertical drop of 1,600 ft. Of this distance the aerial gear accounts for three-quarters of a mile. The system adopted for the remainder consists of a graded tramway following the contours of the hills, along which the full trucks descend by gravitation, and broken at four places by inclined planes. Once this system has been got into proper working order it will present no difficulty.

ORE RESERVES.

The ore reserves are made up of pay ore "at grass" (broken in the course of development) and ore ready for stoping. Until further development at deeper levels on No. 4 Reef is possible, no ore below the present tramway level is counted in the ore reserves: and on No. 2 Reef none below the level of the existing adit. A conservative estimate of the ore reserves, calculated with the above reservations, is 5,000 tons of an average value of 8 dwts. per ton. On a 5-stamp basis this tonnage represents about seven months' crushing. With working costs at 15s. per ton and an estimated extraction of 80 per cent., the profit in working will be over 10s. per ton, or about £350 per month. Development is being pushed ahead as quickly as possible, so that the ore reserves will be increasing at a much more rapid rate than the five stamps can crush. As soon as this course is justified, a further five stamps will be put into commission. With the larger tonnage crushed, the working cost per ton will be considerably reduced, and an increased profit per ton will be shown.

Bantjes Consolidated Mines.

The Bantjes Consolidated won gold to the value of £82,103 in the quarter ended the 30th of September. The total working expenditure was £71,361, equal to 21s. 8d. per ton, and the working profit £10,742, equal to 3s. 3d. per ton.

THE YEAR WITH THE VAN RYN GOLD MINES ESTATE.

Net Profit, £254,526—Ore Reserve Position.

THE report of Van Ryn Gold Mines Estate, Ltd., for the year ended June 30, 1914, shows:—Net profit, £254,526; brought forward, £18,218; total available profit, £272,744; dividend No. 20, £112,500; dividend No. 21, £112,500; taxes, £23,637; sundries, £7,942; balance to be carried forward, £16,165. The mill ran 327·16 days, and with accessory tube mills crushed 439,900 tons of ore, yielding 139,246·708 ozs. of fine gold, of the value of £590,128, or at the rate of £1 6s. 9·960d. per ton. Working expenditure amounted to £351,142, or 15s. 11·576d. per ton milled, resulting in a profit of £238,986, equal to 10s. 10·384d. per ton. The decrease of £33,933 in the year's profit as compared with that of the preceding year is attributable to two causes connected with the white labour strikes—firstly, the actual loss of tonnage, and, secondly, the considerable disorganisation and shortage of native labour which followed. For two or three months after each strike the grade fell materially below normal, resulting in the average recovery value of the ore for the whole period being 1s. 2d. per ton lower than for the preceding year. The manager's compilation of the ore reserves at the close of the past financial year is: Fully developed, 1,973,312 tons; value, 6·49 dwts., or £1 7s. 7d. per ton over 53 in. Partially developed, 80,586 tons; value, 11·5 dwts. or £2 8s. 10d. per ton over 62 in. In addition, there are 1,013,330 tons of either fully or partially developed ore of a value of 4 dwts. or under—and therefore classified as unpayable—a large proportion of which, however, may eventually prove to be capable of being profitably handled. The small reduction in the ore reserve tonnage is likewise due to the labour difficulties referred to. The managing director points out that the ultimate effect on the ore reserves was less marked than at one time might have been anticipated. No credit is taken in the company's balance sheet for these reserves, the cost of which has been met out of past profits. The heavy capital expenditure incurred during the past few years has now practically ceased, the amount for the year being only £3,199, as compared with £21,009 for last year. Boreholes have been sunk, which are yielding approximately 150,000 gallons of water per day, a quantity equivalent to about half the total requirements of the mine. Not only will this supply, if maintained, provide a much-needed security against drought, but will promote economy. The dividends paid make a total of 45 per cent. (9s. per share) for the year. Dividends amounting to £1,919,500 have been paid since the incorporation of the company. The subjoined figures reflect the year's work:—

	1914.	1913.
Tons crushed	439,900	456,190
Gold recovered	£590,129	£637,788
Gold per ton	26/10	27/11
Working costs per ton	16/-	16/-
Profit per ton	10/10	11/11
Total profit	£238,986	£272,919
Capital expenditure	£3,199	£21,010
Net profit	£254,526	£288,853
Brought in	£18,218	£17,753
Total available	£272,744	£306,606
Dividends	£225,000	£237,500
Taxes	£23,637	£25,598
Sundries	£7,942	£25,290
Carry forward	£16,165	£18,218

The disorganisation of operations resulting from the strikes not only affected the profits, but also the development operations. In this connection the following table will show the position:—

	1914.	1913.
Reserves fully developed, tons ...	1,973,312	2,064,529
Value per ton	27/7	27/8
Over inches	53	51
Tons under 4 dwt. (accumulation)	1,013,330	843,134
Development footage	8,691	14,661
Development costs	£42,000	£42,929
Cost per foot	£4·83	£2·83

In the course of his annual report, the managing director, Mr. George Albu, writes, *inter alia*:—

Working costs for the year under review reflect an insignificant increase of ·380d. per ton, which is also attributable to the influence of the disturbed labour conditions. The fully developed ore reserves, as detailed, in comparison with those at the close of the previous year, show the same average value and a reduction in quantity of only 91,217 tons, which may be regarded as eminently satisfactory in view of the considerably reduced amount of development work carried out. *No. 3 Mine.* As will be seen on reference to the manager's report attached hereto, the development work in this section of the property during the past financial year shows a considerable curtailment as compared with the footage obtained for the previous year, by reason of the reduced number of native labourers available in the earlier months of the period under review. Only 2,707 feet of driving, rising and sinking were effected on Main Reef (as against 6,109 feet for the preceding year), of which 1,613 feet sampled on reef gave an average value of 6·56 dwts. over 38 inches, and 848 feet disclosed low values. The total footage sampled on Main Reef in this section up to the 30th June last is 10,222 feet, of which 6,984 feet have given an average value of 6·3 dwts. over a width of 39 inches, and the remaining 3,238 feet show apparently unpayable values. I may add that since the close of the year (30th June last), 473 feet have been driven, etc., on Main Reef, giving an average value of 7·9 dwts. over 38 inches—the whole of this later development thus showing payable values. *South Reef.*—For the same reasons as above mentioned, the development effected on South Reef during the past year has been comparatively insignificant in quantity, only 499 feet being driven and sunk on reef, as compared with 1,412 feet for the previous year. The values disclosed by this work have not been so favourable, as whilst 194 feet showed an average value of 7·5 dwts. over 40 inches, the other 305 feet only assayed 3·0 dwts. over an average width of 44 inches. I must point out, however, that the total development on this reef to the 30th June last shows that, for 2,688 feet sampled, 2,383 feet have assayed 9·5 dwts. over 38 inches, as against 305 feet of low grade ore of an average value of 3·0 dwts. over 44 inches. Moreover, the values in the deepest working, *i.e.*, a winze from the 4th level, average 7·1 dwts. over 39 inches for 60 feet sampled. *New Construction Work.*—Expenditure under this heading shows a very decided reduction for the past year, the total amount involved being only £3,299. This outlay is chiefly in respect of additional mine pumps in No. 2 shaft, and two extra steel tanks and settlers for the east sands plant; the latter installation, as pointed out in the accompanying report of the manager, has not only served its initial purpose of allowing for repairs to the other tanks of the east cyanide plant, but has also made for lower residues, and therefore higher extraction. With regard to the general development of the property, reference has been made in previous years to the unusually large number of separate reef bodies in the different sections of the mine. I may state as a matter of interest that in No. 4 mine, in which work on the hanging wall leaders has previously been confined mainly to the east side of the mine, these reefs are now being proved on the west side, and good results have been obtained in the extreme western ground, the hanging wall leaders are also being thoroughly tested throughout No. 5 mine, on the west side of which a number of good value stopes are in operation, and there are also indications of the existence of good ground on the lower levels immediately to the east of the shaft, as the following figures relating to raises now being put up demonstrate: 5th level raise, 60 feet sampled assay 12·4 dwts. over 37 inches; 6th level intermediate raise, 45 feet sampled assay 8·6 dwts. over 36 inches; 6th level raise, 70 feet sampled assay 7·6 dwts. over 37 inches.

Diamond Outlook for New Year.

Reuter's Amsterdam correspondent quotes a German newspaper statement to the effect that the Diamond Exchange at Antwerp and some diamond-cutting works will probably be opened in January. The majority of the diamond dealers are still in Holland.

Welgedacht Dividend.

In the tabulated list of dividend-paying companies on page 326 of our last issue, which read as follows: rate 10 per cent. on a capital of £156,750, amount £15,675; this should read as follows: rate 5 per cent. on a capital of £156,750, amount £7,837.

OUTLOOK FOR PIGG'S PEAK DEVELOPMENT.

Estimates of Ore Reserves Vary—Shareholders Insist on Dividends.

The meeting was held on December 10 at Salisbury House, London Wall, E.C., Captain F. B. Lowson (chairman of the company) presiding. The Chairman, in moving the adoption of the report and accounts, said: Turning first to the accounts, it will be seen that the issued capital remains the same as last year namely, £223,226. The debenture issue has been reduced by £5,100, and now amounts to only £15,625, which sum we hope to reduce further during the current year. The profit for the year, after writing off £6,000 for depreciation, has amounted to £10,063 2s. 5d., which has been added to the credit standing to profit and loss account, raising it to £25,118 19s. 3d. The additional expenditure to capital account is only £199 8s. 7d. in the case of property and machinery, and from this account we have written off £6,000. On the question of ore reserves you will see that Mr. Ward, who was in charge of the mine at the end of the financial year, estimated that on March 30 last there were 71,428 tons in the two sections combined, of an average assay value of 7.2 dwts. We have during the last few days heard from Mr. Sharpley, who is now the manager, that he does not quite agree with Mr. Ward's figures. Mr. Sharpley states that he had not yet had time to go into figures closely, and will send us a further report; but, at the first blush, he considers that the figures in Mr. Ward's report are rather optimistic. You know that at the present time there is a rebellion in some parts of the Union, which I am glad to say seems now to be flickering out. I am happy to tell you that this has not affected Swaziland, and our operations have in no wise been interrupted. You may think that the board might have seen their way to declare a dividend, and I can assure you they were anxious to do so, but, after mature consideration, they concluded that, until the question of the ore reserves is set at rest and it has been proved to what extent the deposits carry payable values in depth, it is the best policy at present not to do so, but to husband the Company's resources and maintain the company in the strong financial position it is in to-day. A discussion ensued, in the course of which shareholders urged that the promise of a dividend held out at the last meeting should be fulfilled, seeing that the Company had £34,000 odd in liquid assets, and that a distribution of 1s. per share would still leave about £23,000 in hand. After further discussion, the Chairman said that he would be willing to meet the shareholders by suggesting that a dividend of 6d. per share should be paid forthwith, and that the local board should be made acquainted with the views expressed at the meeting, and that, if they assented, the distribution should be increased to 1s. per share. Finally, the original motion for the adoption of the report and accounts, with the amendment that a dividend of 6d. should be declared at once, was carried.

Correspondence and Discussion.

Comments on Questions Arising in Technical Practice or Suggested by Articles in the Journal—Views, Suggestions and Experiences of Readers.

Southern Cross Whaling Company, Capetown.

To the Editor, *South African Mining Journal.*

Sir,—A shareholder in the above company informs me that on asking for information as to the present position of this company, that no reply has been received from the secretary to date. I enclose a copy of the position in which the company was stated to be in on the 18th August, 1914. Taking the full amount of indebtedness to the bondholders and the bank, we find the total £9,200, plus interest, on an issued capital of £44,991. In a case of this kind, are not the shareholders justified in asking the directors to have the assets of the company put up to auction to see if there is no purchaser obtainable beyond the value of the bondholders' claims. Any information that you might pass through your journal would be appreciated by the writer and other shareholders in this company.—Yours, etc.,

W. W.

Durban,
December 29th, 1914.

[The company is now in the hands of liquidators at Capetown, to whom enquiries should be addressed.—Ed.]

Notes on Transformers.

To the Editor, *South African Mining Journal.*

Sir,—I have been reading an article in your journal of December 19th, in which Mr. Kirkland discusses the paper of Mr. Dinham Peren on Transformers, read before the S.A.I.E. As regards the temperatures given by Mr. Kirkland, 135 deg. C. and 150 deg. C., the textbooks used to give 180 deg. C. and 200 deg. C. for the respective standard tests for flashing and burning. In any case it would seem to be advantageous to get the power companies and electrical contractors of the Rand to furnish returns—say for three years—of both transformers and switch explosions, together with the tested temperatures of their several oils. The transformer and switch are coupled together, as it is the common practice of the reef to use the same oil for both purposes. One frequently hears it said by electrical workmen that these explosions are due to inferior oil. Now, if such is the case, the debased standards would seem to be responsible for the many fatal and dangerous accidents that have occurred. If "Safety First" is not just a bluff, it should be the aim of all concerned to revert to the higher flashing and burning tests. In one transformer explosion it would have been impossible to remove the cover, had the higher flashing standard been in vogue, as the temperature would have necessitated the use of thick leather gloves in handling the nuts and cover. With regard to the moisture troubles, caused by the admission of cold air into the transformer case, they appear almost microscopic in comparison with a very common practice in the installing and repairing of transformers. The completed core is placed on the ground and dried out with electric current, then it is placed in its case, which is filled up with cold oil at the highest possible speed. Sometimes this procedure is varied by leaving the core to cool for a whole night. Any article that has been subjected to severe heating, such as to make it bone dry, must certainly be affected by condensation whether in contact with cold oil or the atmosphere. It seems to have escaped the notice of most that the application of current to the core when in case, and the gradual filling of that case, would remove a heavy handicap from the oil.—Yours, etc.,

LISUART.

MINING MEN AND MATTERS.

Mr. F. Graham Bell, lately of the New Primrose, has been succeeded at the State Mines by Mr. Van Eyssen.

* * * *

Mr. E. G. Izod has succeeded Mr. J. H. Rider as head of the engineering staff of the Central Mining—Rand Mines group.

* * * *

Mr. R. G. Pearson, A.I.M.M., M.I.M.E., who is farming in the Standerton district, but has been on commando since August, leaves this week to rejoin the Union forces.

The best "Reef Traveller" is the *South African Mining Journal.*

THE DECEMBER OUTPUT: GROUP RETURNS.

Results Affected by Several Setbacks—Crown Mines, Bantjes, Village Main and Ferreira Deep Suffer.

Rand Mines Group.

The following are the results of crushing operations of subsidiary companies for the month of December:—

Company.	No. of Stamps Running.	Tube Mills.	Tons crushed.	Estimated Working Costs per Ton.	Total Fine Ozs.	Total Estimated Profit.
Rose Deep ...	300	7	55,000	16/10·4	16,164	£21,251
Geldenhuis Dp..	300	7	47,500	21/ 8·5	14,511	9,531
Nourse Mines...	260	7	44,900	22/ 3·6	14,720	11,906
Ferreira Deep...	280	7	46,450	21/ 9·9	18,464	26,650
Crown Mines ...	660	26	183,000	16/ 3·9	53,079	74,070
Durban Rd. Dp.	100	3	24,190	22/ 3·7	7,679	5,207
Totals & averages	1900	57	401,040	18/ 8·5	124,617	£148,615

Ferreira Deep, Ltd.—Repairs No. 2 shafe completed and normal milling resumed 1st January. Grade for month was low, as hoisting was necessarily confined to ore from poorer section of mine.

Crown Mines, Ltd.—The poor results are due entirely to the disappointing yield which continues considerably below what is indicated by the ore reserve values.

The following are the results of crushing operations of Central Mining companies for the month of December:—

Company.	No. of Stamps Running.	Tube Mills.	Tons crushed.	Estimated Working Costs per Ton.	Total Fine Ozs.	Total Estimated Profit.
Modder B. ...	120*	5	40,700	15/ 4·3	18,045	£44,699
New Modder ...	180	7	48,000	16/ 7·1	23,130	57,542
City Deep ...	150	9	45,000	21/ 3·5	21,142	41,102
Village Deep ...	180	7	49,900	17/ 4·4	16,618	26,632
Village M.R. ...	160	4	27,240	19/ 3·6	8,761	10,315
Robinson	250	6	52,600	14/ 5·0	18,853	41,439
Bantjes Cons. ..	100	3	16,890	26/ 8·4	5,552	824
Totals & averages	1140	41	280,330	17/ 9·2	112,101	£222,553

* The stamps at the Modderfontein B. Gold Mines, Ltd., are 80 Californian stamps and 16 Nissen stamps; the latter are equivalent to about 40 Californian, making a total equivalent of 120 Californian stamps.

Village Main Reef Gold Mining Company, Ltd.—Normal operations resumed 14th December, until then ore hoisted was from poorer section of mine; better grade ore since hoisted was not completely treated at close of month. High yield per ton November due to close clean up that month.

Bantjes Consolidated Mines, Ltd.—Repairs to shaft progressing, but only slow advance possible. Water and power mains reconnected and pumping proceeding normally. Hoisting at east shaft produces approximately 2,000 tons per week. Current month's operations will necessarily result in a loss.

Neumann Group.

The following are particulars of the results achieved by the crushing companies of this group during last month, viz.:—

	TONS.	YIELD.	PROFIT.
Witwatersrand Deep ...	40,075	£55,581	£20,062
Wolhuter	32,100	39,878	12,263
Consolidated Main Reef...	22,320	34,580	10,507
Main Reef West	22,110	25,444	1,086
Knight Central	23,200	24,907	3,272
Total for Group ...		£180,390	£50,190

Barnato Group.

The results of operations of the Barnato group for December are as follows:—

Mine.	Stamps.	Tons Crushed.	Revenue from Gold.
Consolidated Langlaagte ..	90	48,000	£64,670
Ginsberg	75	15,089	16,113
Glencairn	160	20,470	14,873
Government Areas	90	14,600	15,576
New Primrose	155	22,300	22,455
New Rietfontein	65	7,880	7,441
New Unified	60	13,560	13,559
Quest	35	2,784	2,587
Van Ryn Deep	80	41,910	74,748
Witwatersrand	210	41,000	52,963
December totals ...	1,020	257,593	£314,988
November totals ...	1,025	254,146	£300,448

Mine.	Total Working Costs.	Working Costs per Ton Milled.	Gross Profit including Sundry Revenue.
Consolidated Langlaagte ..	£34,865	14·527	£30,401
Ginsberg	13,059	17·309	3,177
Glencairn	12,616	12·326	2,483
Government Areas	14,191	19·951	1,487
New Primrose	14,178	12·715	8,592
New Rietfontein	7,160	18·172	506
New Unified	8,426	12·427	5,273
Quest	2,361	16·962	277
Van Ryn Deep	33,640	16·054	41,965
Witwatersrand	29,171	14·230	26,076
December totals ...	£199,967	15·526	£120,237
November totals ...	£193,448	15·223	£111,210

Monthly gross profits: January, £87,277; February, £94,055; March, £104,704; April, £104,493; May, £110,139; June, £115,230; July, £118,604; August, £117,064; September, £114,995; October, £116,379; November, £111,210; December, £120,237.

Albu Group.

The following are the details of results regarding the November operations of the producing mines of the General Mining and Finance Corporation group:—

Company.	Stamps.	Tons Crushed.	Total Cost.
Aurora West	80	14,800	£13,318
Meyer and Charlton	75	14,997	13,063
New Goch	120	31,350	20,874
Roodepoort United	75	34,644	28,793
Van Ryn	140	40,100	28,210
West Rand Consolidated ...	100	27,800	26,563
	590	163,691	£130,821

Company.	Cost per Ton.	Total Revenue.	Profit.
Aurora West	17/11·9	£17,852	£4,534
Meyer and Charlton . .	17/ 5·1	33,381	20,318
New Goch	13/ 3·8	31,457	10,583
Roodepoort United .	16/ 7·5	31,282	2,489
Van Ryn	14/ 0·8	49,256	21,046
West Rand Consolidated ...	19/ 1·3	32,639	6,076
		£195,867	£65,046

Goerz Group.

Results of operations of the crushing mines comprising the Goerz group for the month of December, 1914.

Company	Stamps.	Tube Mills.	Tons Crushed.	Total Value of Output.	Total Profit.
May Consolidated ..	100	—	13,840	£9,152	£634
Princess Estate	60	5	22,000	27,297	1,005
*Geduld Proprietary ..	60	5	21,200	34,584	9,520
	220	10	57,040	£71,333	£11,159

* In the case of the Geduld Proprietary Mines, Ltd., a reserve of 5,324 ozs., obtained from a small block of ore of exceptional value, is in hand.

Brakpan Mines.

The Decemper output was as follows:—Stamps working, 140; running time, 29 days; ore crushed, 54,247 tons; tube mills working, 9; ore hoisted, 61,552 tons; ore from dump, 1,320 tons; waste sorted, 13·08 per cent.; fine gold declared, 17,595 ozs.; value declared, £74,184, equal to 27s. 4d. per ton milled; working costs, £47,849, equal to 18s. 0d. per ton milled; working profit, £25,335, equal to 9s. 4d. per ton milled.

New Heriot.

In December the New Heriot milled 13,400 tons; 5,719 ozs. were recovered at a profit of £10,521.

THE COPPER SITUATION IN EUROPE AND THE U.S.A.

Protests by American Producers Against Britain's Attitude.

INTEREST continues keen in the probable outcome of the situation created by the attempts of Great Britain to prevent copper reaching Germany and Austria, in which it has taken what Americans call a "high-handed" method of stopping shipments, to any other country, which are not definitely proved to be retained in that country. The copper on the "Kroonland," which carried 3,158,400 lb., the "San Guglielmo," with 1,568,000 lb., and the "Regina d'Italia," with 705,600 lb., was removed at Gibraltar, and the vessels allowed to proceed to the Italian ports to which they were bound. The "Ascot," carrying 3,759,160 lb. copper, has been ordered before the British prize court. The principal copper-selling agencies who first made a protest to the State Department have engaged John Basset Moore, formerly solicitor for that department, to present their case, and the matter was taken up in mail week. The Chambers of Commerce at Butte and Anaconda have sent a memorial to President Wilson in the following words: "Such narrowing of foreign markets, with the recent restricted demand in this country, will render impossible the continuance of our copper production even at the present curtailed rate, will close our mines and smelters, the main industries of Silverbow, Deer Lodge, and other countries of Montana, and so restrict the labour demand as to entail most serious disaster to these communities." The *Mining and Scientific Press* says:—The British Ambassador, Sir Cecil Spring-Rice, has been in conference with the State Department, and it is announced that copper consigned to Italy for home use will not be subject to seizure, but copper which has been consigned to a belligerent country or to order will be subject. The Italian Government has prohibited the export of copper from Italy, but not the transit of copper through Italy to a foreign country. However, it is not likely that copper producers would care to chance the transportation through Italy of copper consigned to a German consumer. Copper producers must give assurance that metal shipped to Italy is for home consumption, and not for re-export to Germany or Austria. It is said that arrangements have already been made for the transfer of copper to Switzerland through Italy. Switzerland is expected to become a large consumer of copper during the war period. Norway, Denmark, and Sweden have given satisfactory assurances to Great Britain, and it has been announced that consignments to named consignees in those countries will be passed by the British patrols without question. The steamship lines have now taken fright and refuse to accept consignments of copper to Italy and Holland, and the government war risk bureau also refuses to insure shipments. Exports of copper to Europe in the past 10 months have been as follows, in pounds:—

To	1914	1913.
England	155,962,240	104,944,000
France	112,712,320	122,449,600
Germany	198,132,480	275,963,520
Holland	131,969,600	144,506,880
Belgium	6,442,240	4,941,440
Austria	30,932,160	31,050,880
Italy	43,480,640	35,562,240
Miscellaneous ..	21,911,280	2,755,200
Total .. .	701,542,960	722,173,760

Randfontein Estates.

On page 337 of our issue of 2nd inst., referring to the Randfontein Estates, we stated that: "The rebellion has exercised a detrimental influence (on native labour) and actually our complement has been completed." This is a misprint, and should read: "Our complement of native labour has been depleted," not completed.

Bad Times for Blaauwbosch Diamonds.

The annual meeting of Blaauwbosch Diamonds, Ltd., was held last week. The Chairman, in moving the adoption of the annual report and accounts, explained the cause of the mine having closed down in face of the fact that their very remunerative contract for the sale of diamonds only expired that day. The war with Germany would not in itself have prevented the company from carrying on its full operations. In fact, when all the other diamond mines had decided to close down, the Board resolved that, as they had practically disposed of their whole production at the end of the current year, there was no just cause for the company to stop; but misfortune did not come only by war. The main engine, from which the motive power for driving the whole of the treatment plant was derived, broke down so seriously that experts advised it would be impossible to effect the repairs in this country. The suppliers of the engine would not undertake to renew the broken parts within such a time as would enable the Board to get any benefit out of the diamond contracts. They then thought of replacing the engine, but no one would undertake such replacement within a period sufficiently short to give the company any benefit under the contract. The company had made a claim on the firm that supplied the engine for damages. The compulsory closing down of the mine was very unfortunate for more reasons than one, especially as the company, owing to a large slip of reef, was prevented from hauling from the open mine for more than six and a half months of the period under review. Notwithstanding the fall of reef and the breakdown of the plant, the company declared dividends amounting to 60 per cent. of the capital, against 67½ per cent. for the previous year, and were able to carry forward a sum of £2,617. It was the Board's intention to instal a new engine of a superior type and capacity as soon as there was some justification for recommencing operations. "For the time being," added the Chairman, "our future is in the lap of the gods." The amounts levied against this company on account of income tax was settled at £595 11s. 8d. They had been threatened by the Treasury with an action for recovery of over £2,000 under the Profits Tax Act, which claim the company was disputing, and would resist, on the ground that it was only liable under the Income Tax Act. It had been decided to remove the head office of the board to Kimberley, as it was felt that the mine, being situate near Kimberley, could be administered very much better by a Board resident there.

ECONOMIC GEOLOGY OF THE BELGIAN CONGO, CENTRAL AFRICA.—II.

[BY SYDNEY H. BALL AND MILLARD K. SHALER.]*

PRINCIPAL INTRUSIONS AND PERIODS OF DEFORMATION.

The supposed pre-Cambrian rocks of the Belgian Congo consist of a metamorphic sedimentary series with which are associated ancient igneous gneisses and schists, and granular igneous rocks. In at least the Tanganyika country there are two series of metamorphic sedimentary rocks of pre-Cambrian age, differing widely from one another in the amount of folding, faulting and intrusion, and consequent metamorphism suffered. The main structural features of the older rocks on the north and south rims of the Congo basin have an east and west trend, while the rocks of the eastern mountains strike north and south, and those of the Crystal Mountains, west of north to east of south. The older rocks thus trend as a rule parallel to the rim of the basin. That the pre-Cambrian was a period of profound intrusion may be gathered from the fact that throughout the colony the following pre Cambrian (?) rocks exist, beginning with the oldest: (1) Quartzites and schists of sedimentary origin, (2) basic igneous schists probably partly lavas, contemporaneous with (1) and slightly younger intrusives, (3) granite gneisses, (4) diorite and gabbro, massive or slightly gneissic, (5) granite. The diabase, however, so frequently found cutting the above rocks, is presumably in part, if not wholly, of post-Permian age. In the Crystal Mountains at least it is reported to cut the Kundelungu rocks.

During pre-Cambrian time there were several periods of folding, and at its end the land was raised above the sea, and appears in several regions to have been subjected to erosion until the Devonian. Elsewhere, however, as in the Katanga, where Cornet and Studt have found sedimentary rocks, which they believe range in age from pre-Cambrian to Triassic, the colony appears to have been from the earliest periods to Lower Carboniferous time (according to Studt's latest work perhaps only to Devono-Silurian time), the site of a sea or succession of seas. In this region, in addition to pre-Cambrian granites which, if they are not certainly recognized in the Katanga by Studt, occur to the east of Lake Tanganyika on the Rhodesian-German East Africa frontier, granitic intrusions mark the close of the Ordovician and mid-Devonian periods. The Ordovician granite was followed by magmatically related greenstone and in or prior to mid-Devonian times there was according to Studt a second period of greenstone (finely crystalline diorite) intrusion. Important folding occurred not only as elsewhere in the colony, according to Cornet, at the end of pre-Cambrian and in Middle (?) Carboniferous times, but also at the end of and in mid-Silurian time, or respectively according to the latest conclusions of Studt in pre-Silurian and mid-Devonian time. Prior to the deposition of the Kundelungu beds (Permian of most geologists) all important igneous activity, excepting unimportant diabase intrusions, appears to have ceased in most portions of the colony, although a few flows and pipes of basic lava, resembling Kimberlite and presumably of Cretaceous age, exist in Permian beds in the Katanga region, and dolerites are interstratified with these same beds in that region. According to Studt some of these rocks intrude not only the Kundelungu beds, but also the Lualaba formation (Jura-Trias). He states: "The rocks of the Kundelungu and Lualaba series are penetrated by a series of igneous rocks, forming sheets, sills and dikes, and belonging to the felsite, diorite, porphyrite, dacite, andesite, and basalt types. In the lower Lualaba valley large areas are covered by an amygdaloidal basalt flow which in places penetrates the beds of the coal formation (in part at least Lualaba in age. (S. H. B. & M. K. S.), and probably corresponds in age with the Batoko Basalts of the Zambesia valley in the Victoria Falls district." Perhaps broadly related to these intrusions are some of the rather sparsely distributed diabase dikes of other portions of the colony already mentioned. In the north-eastern part of the colony are Tertiary and recent volcanic rocks, some of the volcanoes of the Kivu region being now active. With the exception of the diamond bearing pipes of the Katanga region, these post Permian (if such be their age) igneous rocks are believed to be of no economic importance, and we are of the opinion that no metallic mineralization later than that of the Middle Carboniferous was of importance in the Belgian Congo (or according to Stud't most recent work mid-Devonian). With the beginning of Permian time, marine deposition ceased in the Belgian Congo, except on the coastal plain, and continental and fresh water deposits, derived from the eroded pre-Cambrian and Paleozoic rocks of the basin's borders, were laid down. The moderate relief of this old pre-Cambrian and Paleozoic plateau, except where affected by post Mesozoic faulting, is a measure of the tremendous erosion suffered by this portion of Africa and the relative unimportance of post Paleozoic movements. In the Kasai region at least prior to the depositon of the Jura Triassic beds, the pre-Cambrian rocks were eroded to a peneplain from which but few monadnocks of resistant rocks arose. The Kundelungu (Permian) beds present in several portions of the colony were deposited after an important period of erosion, and are presumably continental deposits, while the Jura Tiassic rocks were laid down partially on land (in part at least desert deposits), and perhaps partially as lacustrine and fluviatile deposits. In addition to a slight erosional unconformity between the Permian and Jura Triassic beds, there is also between the two a slight discordance in dip, although important folding stopped prior to Permian time. Since the deposition of the Jura-Trassic beds it is probable that the central portion of the basin has sunk somewhat relatively to the rim region, although the quaquaversal dip is partially at least original. In the upper Congo river region from a point a short distance north of Kasongo, to its source, at several places morainal deposits have been found, indicating that in late Permian or early Jura-Triassic time glaciers existed to the south. In Mesozoic time the eastern portion of the colony was cut into several blocks by a more or less parallel system of north to south faults, by which the positon of lakes Tanganyika, Kivu, Albert, Edward and Albert, and Upemba, and of the neighbouring mountain ranges was largely determined. The earliest of these movements was according to Cornet post-Permian and pre-Triassic and according to Studt probably middle Devonian and certainly pre-Permo-Carboniferous. Adjustment along these planes has continued to the present day, for this region is subject to rather frequent earthquakes and these faults are the sites of hot springs and volcanic phenomena. The coastal plain in late Mesozoic and Tertiary time underwent several incursious by the sea, which were accompanied at one time or another by important faulting along the west front of the Crystal Mountains. These movements, however, within at least the Belgian Congo, were not accompanied by igneous activty, although Tertiary lavas are reported from farther south in Portuguese West Africa.

GENERALIZATIONS CONCERNING ECONOMIC GEOLOGY.

The Belgian Congo, with the exception of the coastal plain, is an ancient plateau which has suffered successive erosional periods, not only in pre-Cambrian and Paleozoic times, but also a particularly important one continuing from Late Triassic to Recent time. The thickness of rocks removed must have been very great. Because of this and the fact that no intrusions of post-Middle-Carboniferous age (according to Studt's correlation mid Devonian) are know to have been important metallic mineralizing agents, it is natural that those metals which, according to our present knowledge, are deposited near the surface (mercury for example), do not occur in important amounts. The ore deposits of the Katanga Paleozoic rocks, however, are not of deep-seated nature, as these rocks, though in places closely folded, have not been particularly deeply buried. In the pre-Cambrian rocks, however, which form large areas in the Katanga, and greatly predominate among the pre-Permian rocks in other portions of the rim regions, the majority of the ore deposits are of the types deposited at great depths, and those later to be found as mining progresses will probably be mineralized quartz lenses, magmatic segregations, sulphide and oxide segregations, and contact metamorphic deposits. From the rather striking likeness of the pre-Cambrian rocks of the various portions of the colony, it is not surprising that their ore deposits throughout the colony have many points of similarity. The limited bulk of limestone in part accounts probably for the absence of important lead and zinc deposits, although the absence may be more apparent than real, as outcrops of lead and zinc ore are much more apt to be passed over in prospecting than the brilliantly hued surface showings of certain types of copper deposits. The almost complete absence of Tertiary intrusives and the depth of the erosion explains the non-presence of certain types of silver deposits, and if argentiferous ore bodies are later to be found, they will presumably be of intermediate or deep types. In the north-eastern part of the colony the gold mineralization appears to be of pre Cambrian age, and many of the lesser, commercially unimportant copper deposits, and most of the iron ore deposits throughout the colony are of similar age; indeed, metallic mineralization, with the exception of the Katanga Paleozoic tin and copper, the Ruwe gold deposits and the recent iron ores, is presumably largely pre-Cambrian. The diamond deposits at least those of the Katanga, are of post-Permian and perhaps of Cretaceous age. The flat-lying sandstones and shales of the central basin are without important epigenetic deposits. They may possibly later be proved to contain locally lignite and petroleum. Stray colours of gold occur therein, and the placer diamonds of the Kasai region were probably weathered out of certain of their conglomerate beds. The original source of the precious stones, however, must be looked for elsewhere. The Tertiary and Mesozoic sedimentary rocks of the coast are known to contain sandstone with a high bitumen content, but otherwise appear to be barren. The recent gravels of the rim highlands contain in places concentration of the more resistant minerals, gold, diamonds, monazite, etc. Although the greater portion of the central Congo basin is of little interest from a mining standpoint, the rest of the country may be considered rather well mineralized. Of particular interest to economic geologists are the Aruwimi Uelle region in the northeast part of the colony; the Katanga in the south-eastern corner adjoining Rhodesia, and the Kasai Lovua region in the south-western portion of the colony. The analogy between the geology of the Central Africa plateau and of Brazil is close, as pointed out by Cornet, and to an equal extent the mineral resources of the two countries resemble one another. Not only are alluvial diamonds widely distributed over these two regions, but the mineral associations in instances resemble one another. In each country gold deposits are closely associated with hematitic quartzites. Further, there are similarities between iron ore deposits of the two countries and on the coasts of each occur bituminous sedimentary rocks of more or less importance

(To be continued.)

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*Published by permission of the Societie Internationale Forestiere et Miniere du Congo in "Economic Geology."

Rhodesian Section.

LATEST MINING NEWS.

Chamber of Mines' Report—Year with the Wankie Colliery.

The report of the Executive Committee of the Rhodesia Chamber of Mines for the month of November, 1914, states, *inter alia* - The following is a summary of the returns of native labourers employed on Southern Rhodesian mines during the months of September and October, 1914: Local, September 11,890, October 10,803; Portuguese Territory, September 6,519, October 6,559; N.W. Rhodesia, September 3,835, October 3,548; N.E. Rhodesia, September 5,721, October 5,837; Nyasaland, September 7,581, October 7,724; other sources, September 925, October 882; totals, September 36,471, October 35,353. The number employed in October shows an increase of 1,485 as compared with the same month of 1913. Price of native gold: On the 9th November your committee was notified by a member that the banks had, without notice, reduced the price paid for native gold from 76s. to 75s. per ounce. The banks operating here, viz., the Standard and the National of South Africa and the African Banking Corporation, were written to and requested to explain the reason for the difference paid locally and that paid in the Union of South Africa, which it has been ascertained was 76s. per ounce. No replies were received to this request, but on the 22nd November your committee were advised that the price had reverted to 76s. per ounce. Further representations have been made and replies are still being awaited. The output of gold from Southern Rhodesia for the month of November has been declared at 74,739·94 ozs. fine gold, valued at £311,711, being a decrease of 6,425·08 ozs. in weight and £25,530 in value as compared with the month of October. The following amounts and values of other metals were also declared:—Silver, 15,022·62 ozs., valued at £1,346; copper, 255·14 tons, valued at £12,757; lead, 5·41 tons, valued at £91; asbestos, 294·30 tons, valued at £5,201; coal, 29,614 tons, sales £9,376; diamonds, 65·25 carats, valued at £243. The total value of gold and mineral production for the month was thus £340,725, as compared with £362,422 in the month of October.

* * * *

The fifth ordinary general meeting of shareholders in the Wankie Colliery Company, Limited, was held in London in mail week. Mr. Edmund Davis presided, and moved the adoption of the report for the year ended August 31 last. He reminded shareholders that in presenting accounts at the last meeting the Board were able to state that they showed further improvement over those submitted at the previous meeting; and they were now again in a position to refer to the present balance sheet in a similar manner, the progress being very marked in all directions. The balance of profit and loss account figured at £51,653, compared with £36,774, the difference being due to the large increase in profit, which for the year ended August 31 last was £19,292 more than for the previous twelve months. The cash position of the company showed a material increase, principally due to the large amount received on account of the new issue of debentures, though in the year under review the original debenture debt, which stood on August 31, 1913, at £45,000, had been reduced to £40,000. The two items of loan against securities and cash made a total of £69,329, compared with £40,289 at August 31, 1913. Debtors showed a considerable increase, the amount now being £22,669, compared with £10,670, the difference being due to the large increase in trading. The price at which their concession stood in their books was £166,280. Permanent works, buildings, and machinery and plant amounted to £104,408, compared with £79,824 at August 31, 1913, or an increase of £24,584, notwithstanding deductions made for very heavy depreciation, amounting under these three headings to £14,370, compared with £10,413 in the previous accounts. The Board trusted that the shareholders would approve the scheme submitted that day. Their recommendation was that the original issued nominal capital of the company should be replaced. They had set out the scheme in the report, and would propose that day necessary resolutions giving effect thereto. If the scheme was carried, the shareholders would receive for every share of 10s. they at present held in the company two new shares of 10s. each in the new company, and in the sale contract the directors had provided for the issue of £93,000 of debentures by the new company, bearing interest at the rate of 6 per cent. in exchange for a similar amount which would be outstanding in their own company, as £7,000 of the existing debentures would be paid off by the 31st inst. They had also provided in the sale agreement for the retention by the liquidator of £20,261 13s., sufficient to pay a 5 per cent. dividend on the new capital—equivalent to 10 per cent. on the issued capital of the present company. This dividend would be paid not later than March 26 next, and, for all practical purposes might be considered as an interim dividend in the present company, as the amount would cover profits for the first four months of their new financial year. Notwithstanding this statement the directors did not wish the shareholders to lose sight of the possibility of the company's having to face a falling off in trade, and if, unfortunately, this should happen, there would follow a decrease in their profits. Previous to recommending the reconstruction of the company, the colliery and its equipment were independently examined. It was not necessary to trouble the shareholders with details set out in the report and valuation, but it was of interest to know that the report estimated the coal in the seam in which operations were now taking place, and which could be worked with the present shafts, as follows:—Estimated tons in pillars, 1,157,790; in sight, 1,709,160; and undeveloped, 57,038,037; or a total estimated tonnage of 59,904,987. From this they were advised to deduct 5 per cent. for faults, loss in working, and pillars to be left under railway, 3,000,000 tons, leaving estimated available tons, 56,904,987. These figures showed that if only this portion of the property were worked at the rate of 50,000 tons per month, the "life" of the mine on this tonnage alone would be ninety-five years. Mr. D. N. Shaw seconded the motion, which was carried unanimously: and resolutions were also passed declaring a dividend for the year ended August 31 last of 25 per cent., of which an instalment of 10 per cent. was paid on March 30 last. At a subsequent extraordinary general meeting resolutions were passed approving resolutions for reconstructing the Company as proposed.

Globe and Phœnix.

The Globe and Phoenix Company has declared a third interim dividend of 1s. 6d. per share.

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PROGRESS OF THE CHARTERED COMPANY.

A Review of Rhodesian Activity—The Board's Policy of Building up Revenue—Position of the Land Question—Accounts to March Last—Mining Industry Making Records—Ranching Prospects.

THE report of the directors of the British South Africa Company covers twenty one months since the last meeting, and the accounts and balance sheets for the two years ended respectively March 31, 1913, and March 31, 1914, which accompany it bring the financial information more nearly up to date than has ever previously been practicable. A satisfactory agreement has been arrived at with the Imperial Government under which the second period of the company's administration (ten years from October 29 last) has already begun. The land question is in the position that, by Order in-Council, the Judicial Committee of the Privy Council has been empowered to hear and determine whether certain contentions put forward by the inhabitants and people of Southern Rhodesia in regard to the unalienated lands of Southern Rhodesia are well founded. A preliminary hearing, in reference to procedure only, took place on August 4 last, at which the company, the committee of elected members, and the Crown were represented. Counsel also appeared on behalf of certain persons claiming to represent the native inhabitants of Southern Rhodesia. As the result of this hearing, the various parties concerned were ordered to lodge statements of their respective cases in writing before January 1 next, for the purpose of enabling the Committee to give further directions in regard to the conduct of the proceedings. The board has endeavoured to curtail expenditure so far as this can be done prudently and without injury to the successful prosecution of the various enterprises in which the company is engaged. On March 22, 1913, Mr. Rochfort Maguire, who was then visiting Rhodesia, explained to a representative gathering at Salisbury the terms of a statement of policy which he had been authorised to publish in Rhodesia. The publication of this statement has, the directors state, removed many causes of grievance, and paved the way for the continuance of the company's administration beyond its first term of twenty five years.

SOUTHERN RHODESIA.

The Chief Native Commissioner reports that the loyal demeanour of the native population towards the Government remains unbroken by any unrest or dissatisfaction. The numbers of stock owned by natives, in which all their wealth is invested, continue to show satisfactory increases upon the numbers of last year. A Commission to inspect and report upon the native reserves has recently been appointed by the High Commissioner, with a view to the readjustment of the large areas now set aside for this purpose. It is estimated that the number of European inhabitants exceeded 30,000 during the early part of the present year. The native population is estimated at 712,783. Further evidence of progress is to be found in the Customs returns for the year ended December 31, 1913. It was recognised during the course of the present year both that further Customs revenue was needed to meet the growing needs of the community, and that under the South African Customs Tariff the protection afforded to manufacturers in the Union operated unduly to the detriment of the revenue of Rhodesia, by reducing the importations into that territory of dutiable goods from oversea. A conference upon the matter has recently been held in Pretoria, and certain Ordinances relating to Customs and Excise have been adopted by the Legislative Council. It is estimated on the basis of the 1913 Customs figures that additional revenue will be received to the amount of about £58,000 per annum.

COMMERCIAL POLICY.

The established commercial policy of the company has continued to be carried out energetically during the period covered by the report, with results which the directors regard as eminently satisfactory. Large and increasing amounts of capital are being expended by the company in the development of selected portions of its property, with the object of obtaining a direct return from the capital so invested, both by way of income and of improvement in the capital value of estates. During the latter half of 1913 the board published in Rhodesia proposals for the encouragement of land settlement and immigration. In view of a widespread impression, which the directors believe to have been ill founded, that the adoption of this measure might prejudice the decision by the Privy Council of the questions raised in regard to the ownership of unalienated land, consideration of the draft Ordinance was postponed pending the result of the proceedings. The Gwelo Creamery, which started work at the end of May, 1913, has been of very great help to the farming community by providing a cash market for their cream. At the end of March last the average daily output of butter was about 1,000 lbs. The bacon factory has now been completed on a site granted by the Municipality of Salisbury on the commonage. Business was started in October last, so that farmers have now a further facility for disposing of produce for cash. An oil crushing plant is in course of erection on the same site as the bacon factory. In order to assist tobacco planters to prepare and market their leaf, the company took over from the Tobacco Company of Rhodesia and South Africa, Ltd., in April, 1913, its warehouse and plant at Salisbury, and has since greatly enlarged and improved the premises and machinery. The total storage capacity of the buildings, exclusive of working space, is now sufficient for from 3,500,000 to 4,000,000 lbs. of manipulated leaf. The figures of production for the past years are as follow: 1909 10, 132,310 lbs.; 1910 11, 450,000 lbs.; 1911-12, 1,000,000 lbs.; 1912-13, 2,240,000 lbs.; 1913-14, 1,250,000 lbs. (approximately). The company is incurring expenditure with the object of assisting to find markets for Rhodesian produce (as it has already done to some extent in the case of maize, tobacco, and citrus fruits), and to promote co-operation. The board has been gratified to learn of the recent rapid growth of the co-operative spirit among farmers.

RANCHING PROGRESS.

At the date of the last report the company owned very few cattle. To-day it is ranching on a considerable scale, and is rapidly extending its operations. It is already the largest European cattle-owner in South Africa, and at September 30, 1914, possessed upwards of 28,000 head. The areas which are being utilised by the company for ranching purposes are: (1) Rhodesdale Estate, about 1,000,000 acres; (2) Tokwe Ranch, 100,000 acres; (3) Nuanetsi Ranch, about 3,590,000 acres. The company's ranching enterprise has been conceived on a scale of exceptional magnitude, and the returns that may be reasonably expected from it will in time become of corresponding importance. The board has investigated the question of markets, and, having regard to the upward trend of prices, it came to the conclusion that the as yet undeveloped opportunities of Rhodesia as a meat-producing country could hardly be exaggerated. All experts are agreed as to its unusual merits as a cattle country, which are mainly to be attributed to the exceptional value of its indigenous grasses for the feeding and fattening of stock, even during periods of drought. Geographically Rhodesia is favourably situated in relation to the markets of Europe, and should thus be able, without difficulty, to dispose to advantage of its various animal products when the time arrives for export. Great progress has been made at the company's estates, which have similarly been organised as a separate department, under the management of Mr. C. D. Wise, who formerly also controlled the land settlement department. The estates, regarding which the report furnishes full particulars, are: (1) Premier Estate, Umtali, about 13,399 acres; (2) Mazoe Estate, at the head of the Mazoe Valley, about 14,828 acres; (3) Simoona Estate, Mazoe Valley, 7,897 acres; (4) Simoia Estate, Lomagundi district, about 43,000 acres; (5) Marandellas Estate, about 60 miles from Salisbury, 34,036 acres; (6) Shangani Estate, near Gwelo, 10,000 acres; (7) Pongo Estate, on Pongo River, 3,000 acres; (8) Lobatsi Estate, Bechuanaland Protectorate. The directors attach a very high importance to the citrus fruit industry. A first and trial shipment of 55 cases of oranges from the company's Mazoe Estate arrived at Southampton on July 14 last, well packed and in excellent condition. The average price obtained was 15s. 5½d. per case, as compared with 14s. 3d. per case realised in the same week by other South African oranges. The fruit was most attractive in appearance, and was reported upon very favourably by market experts.

MINING INDUSTRY.

The aggregate value of the mineral production of Southern Rhodesia for the year ended December 31, 1913, showed an advance of £188,206 over the record figures for 1912. The value of the gold production for the first ten months of the current year was £2,958,827, as compared with £2,903,268 for the whole of 1913. It is estimated that the value of the gold output for this year will exceed that for 1913 by about £750,000. This large and most satisfactory increase is mainly due to the additions made to the returns by the Shamva, Cam and Motor, Falcon, Antelope, Eileen Alannah, Golden Kopje, and Bell Mines, all of which became substantial producers during the present year. The value of the mineral output of Southern Rhodesia for 1914 is estimated at about £4,800,000. The output of coal from the Wankie Colliery during the year ended December 31, 1913, amounted to 243,328 tons, an increase of 27,188 tons upon the previous year. The output for the first ten months of the present year was 289,493 tons, the increase for the year being estimated at upwards of 100,000 tons. Dividends amounting to 17½ per cent. were declared by the Wankie Company for 1913, and a total dividend of 25 per cent. is being distributed for the current year. A contract has been concluded with the Union Minière du Haut Katanga for the supply of coal and coke to the Katanga copper mines for a period of ten years. The prospects of this company, in which the British South Africa Company holds nearly half the capital, are excellent. The output of the Rhodesia Chrome Mines, Ltd., for 1913 amounted to 63,383 tons, a slight decrease upon the preceding year's output of 69,261 tons. A dividend of 20 per cent. was paid by this company, as in 1912.

NORTHERN RHODESIA.

A small but energetic agricultural department is carying on experimental work at several centres, and is also engaged upon the breeding of cotton seed of the Nyasaland variety. The Mazabuka Estate is situated on the railway, on the edge of the Kafue Flats. It was formerly managed by the Cotton Growing Association on joint account, but has now been taken over by the company, and is worked as one of its commercial estates. For the present it is planted principally with mealies, but trials are also being made of cotton, citrus, Soya beans, wheat, and other valuable crops. The rubber-extracting plant, which has been erected on a large rubber area on the Chambezi River, is now at work.

RAILWAYS.

The comparative figures of railway receipts for the five years ended September 30 last are as follow:—

Year ended September 30.	Gross receipts of the Rhodesia, Mashonaland and Beira Railways.	Net receipts of the Rhodesia and Mashonaland Railways.
1910	£1,314,343	£642,663
1911	1,671,301	860,491
1912	1,624,691	815,632
1913	1,795,877	921,100
*1914	1,742,612	861,855

* Approximate.

In reference to these figures it may be noted: (1) The traffics during the year ended September 30, 1911, were exceptionally good, owing to a large expansion in trade and settlement in the districts between Bulawayo and Salisbury and in the Belgian Congo; (2) during the year ended September 30, 1913, the receipts were swollen by large importations of machinery and other material required by a number of important mines in Southern Rhodesia; (3) during the later years covered by these figures substantial reductions in rates and fares have been made.

FINANCIAL RESULTS.

After calling attention to certain further changes in the form of the accounts the directors state that the aim of the board is to build up for the company a steady and growing revenue, which will be the cumulative result of revenue derived from a number of different sources. It is believed that careful consideration of the accounts in the light of the above observations, and of the information given elsewhere in the report, will lead shareholders to conclude that steady progress is being made in the realisation of this aim. In support of this view they draw special attention to the following facts:—(1) The total receipts from land from all sources during the year ended March 31, 1914, amounted to £134,700. For the reasons previously given this sum is likely to be largely increased in future years. (2) The revenue from the company's mineral estate during the same year amounted to £63,041. Owing to the recent commencement of production at a number of new properties, of which the majority pay to the company a royalty on gross output, these receipts will be largely increased during the current and succeeding years. (3) The total gross income of the company for the same year, excluding administrative revenue, but including net receipts from land sales, amounted to £422,532. (4) During the current year the company has received, for the first time, a dividend at the rate of 2½ per cent. per annum upon its large holding of shares in the Rhodesia Railways Trust, Ltd., from which the sum of £43,000 was derived. (5) An increasing income is now being earned by the company's ranches and estates, an income which is expected to attain in the future to very important dimensions. So far as the capital accounts are concerned, ample provision exists by way of reserves against any losses which have been incurred in the past, or which may fairly be anticipated in the future; so that when normal conditions have been restored, and the net profits of the company otherwise warrant the payment of a dividend, it should not be necessary to apply profits in the first instance to the extinction of losses.

EFFECTS OF THE WAR.

The directors consider that the disturbances of the company's operations in certain directions, and the financial loss to which it will be exposed, mainly through shrinkage in the capital value of its investments, are not likely, so far as at present can be foreseen, to do more than retard the fulfilment of their hopes. So far as the company's resources are concerned, they remain ample for its present requirements, and at the valuations of July 30 last show little change from the figures appearing in the balance sheet at March 31, 1914. It is anticipated that it will be possible to provide for all current requirements out of income throughout next year. Meeting, Cannon Street Hotel, December 17, at noon.

East Rand Proprietary Mines.

The following is the text of a cablegram despatched to the London office of the E.R.P.M.:—"The following are the results of last month's operations: 820 stamps milled 142,500 tons; 48,109 ozs. fine gold recovered, valued at £203,859; including 1,785 ozs. valued at £7,498 recovered from the treatment of accumulated slime. Profit for the month, £62,501; including £6,234 profit from treatment of the accumulated slime."

The Sheba.

The meeting was held on December 9 at Winchester House, E.C., Mr. C. F. Rowsell presiding. The Chairman, in moving the adoption of the report and accounts, said that the net result for the year showed a profit of £49,549, which, added to the amount brought forward, £11,490, made a total of £61,039. They had written off £3,335 for depreciation of plant, etc. (this being approximately £1,000 more than last year), provided for Transvaal profits tax and income tax, and written off their one half share of the loss on the Rosetta property, which reduced the value at which that property now stood in their books to £2,500. During the year they had paid three dividends of 5 per cent., which absorbed £40,461, and they were carrying forward £9,364, as compared with £11,490 last year. The amount standing to mine development was now reduced to £3,996, and, as the total ore reserves were at present 101,500 tons, these stood at the very low figure of 9d. per ton. The whole of the expenditure on development during the year, amounting to £22,435, had been charged against the mine revenue, and was not carried forward as an asset. Work had been carried out on the Zwartzkopje, Intombi, Southern Cross, and Margaret mines with varying results. The Zwartzkopje mine was still producing a large amount of good ore, but the tonnage estimated available had been reduced from 70,000 to 30,000 tons. He sincerely hoped that on this particular property they might soon again enter upon a more prosperous stage. Prospecting on the Insimbi, where the Manager was endeavouring to locate the Insimbi ore bodies by cross-cutting from the western end of the 6th and 7th levels of the Zwartzkopje, had so far not resulted in any success, but during the coming year further prospecting on this end was to be done by cross-cutting from the 4th level of the Intombi, which it was to be hoped would meet with better results. The Intombi was a mine to which he could refer as being one of the decided successes of the year, as they had exposed and developed on the 3rd, 4th, 5th, 6th, and 7th levels no less than 50,000 tons of ore of an average value of 10 dwts. per ton. The extent of the pay shoot exposed on the various levels was of an equally satisfactory nature, being 210 feet on the 3rd level, 325 feet on the 4th, 155 feet on the 5th, 270 feet on the 6th, and 250 feet on the 7th. The Southern Cross was another promising property, the work done indicating payable results. The working costs per ton for the year under review, exclusive of development and head office expenditure, averaged 23s. 5.92d.—a decrease of 1.51d. as compared with the previous year.

The Simmer Deep Accident.

Arising out of the recent accident, Theodore Albert Malpage, underground manager, and Donald Meredith Ferguson, mine overseer, at the Simmer Deep G.M., appeared before Mr. Jas. Young, R.M., this week, charged with contravening the Mines and Works Regulations, and allowing winding to take place in the west and inner-west compartment of the Clement shaft whilst certain persons were working below the lowest point from which it was required that winding should take place without the aforesaid persons being securely protected from any skip, cage or other winding apparatus, as well as from falling stones or material. Judgment was reserved. The resident engineer, Mr. McLean, was fined for not having detected the faulty condition of the rope.

Ventilation Rules.

A study of the laws of the various countries regulating mine ventilation is an enlightening occupation. In no country have the authorities covered the subject in a more comprehensive manner than in France. The French laws aim at three things—(a) A supply of air sufficient to insure hygienic conditions; (b) enough air to avoid an excessive rise of temperature; and (c) sufficient ventilation to guarantee the absence of danger arising from foul gases or smoke. In French mines the speed of the air current in the shafts and entries must not exceed 26 feet per second, except in such places as are not ordinarily used for the transport of material or the travelling of persons. The law only requires that each man be supplied with 1·77 cubic feet of air per second, and inspectors satisfy themselves as to the mineowners' compliance with this latter requirement by measuring the quantity of air at the intake, and then dividing that quantity by the number of men underground. They further endeavour to see that the bulk of the air reaches the faces of the workings. The French idea of dividing all mines into three classes—namely, distinctly fiery, slightly fiery, and non-gaseous, is a good one. The decision as to which class a mine belongs is left to the local inspector in conjunction with the mineowner and a representative of the workmen. This classification of a mine may relate to the workings as a whole or only to an independent section. The classification of mines in respect to coal dust is on lines similar to that on firedamp. Another interesting rule of the law is that which fixes a maximum temperature in which men may work underground. This prescribed temperature is 95 deg. F. on dry bulb, or 86 deg. F. on wet bulb. There is much that legislators who busy themselves in writing laws to control operations in American coal mines might learn from a perusal of mining regulations of some of the European countries. What we need in America is not so much quantity in mine laws as quality. It is inadvisable to enact measures that cannot be enforced at all, or to pass laws that greatly burden operators, without resulting in the attainment of any desirable end.—*Coal Age.*

THE WEEK IN THE SHAREMARKET.

A Quiet Re-opening—Broadening Tendency—Some Notable Advances.

THE Johannesburg sharemarket re-opened quietly on Monday, the unofficial prices that had ruled previously not being much affected. As the week progressed, prices hardened, and a broadening tendency was displayed in the market, caused mainly by favourable advices from London. One or two ex-dividend stocks almost recovered their dividends, and much steady buying of dividend payers was noticeable. The list below reflects the business of the week:—

	Mon., 4th.	Tues., 5th.	Wed., 6th.	Thurs., 7th.
African Farms	9 2	9 0*	9 0	9 1†
Apex Mines	13 6†	13 6	14 0†	13 6*
Bantjes Consolidated	8 0*	8 0*	7 0*	10 0†
Brakpan Mines	42 6*	—	—	43 6*
Breyten Collieries	20 0*	20 0*	20 0*	
British South Africa	—	12 0*		
Bushveld Tins		0 6*	0 4	0 4*
Cinderella Consolidated	—	—	2 0*	—
City and Suburbans	41 6*		—	40 6*
City Deeps	55 0*	55 0*	55 0*	55 0*
Cloverfield Mines	4 0*	4 0*		3 10*
Consolidated Langlaagte	31 6*	—		31 6
Consolidated Main Reefs	16 0*	16 3*	16 0	17 0
Coronation Collieries	—	18 0*	—	18 6*
Crown Diamonds	1 6*		1 6*	
Crown Mines	86 0*	85 0*	—	90 0†
East Rand Centrals	2 3†	2 0*	2 0*	2 1*
East Rand Coals	1 6	1 6*		1 7*
East Rand Deeps	1 3*	1 3*	1 3*	1 3
East Rand Proprietary	27 6	27 6*	—	—
Eastern Gold Mines		—	1 3†	1 0
Frank Smith Diamonds	1 5	1 6†	1 6†	1 3*
Geduld Proprietary	19 0*	19 0*	19 9*	19 9*
Glencairn Main Reef	—	1 0*	1 0	1 0*
Glencoe Collieries	—	5 0*	5 9	5 9*
Glynn's Lydenburg	8 0	9 0*	9 0*	
Government Areas	20 6	20 3	20 3	20 0
Kaalfontein Diamonds	0 3*	—	0 2*	0 3*
Klerksdorp Proprietary	3 0†	2 0*	3 0†	-
Knight Centrals	5 10*	5 9*	5 11	—
Knights Deep	29 0†		—	—
Lace Proprietary	2 9*	2 9*	2 9*	2 9*
Langlaagte Estate	15 3*	—	—	16 0*
Luipaardsvlei Estate	10 0†	10 0†	10 0†	10 0†
Lydenburg Farms	2 4*	—	2 3*	
Middelvlei Estate	1 0*	—		1 0*
Modderfontein Deep	57 9*	57 0*	57 6*	58 6
New Era Consolidated	4 7*	4 9*	4 6*	
New Geduld Deeps	1 8*	—	1 10	1 9*
New Heriots	—		—	58 0*
New Kleinfonteins	19 3*	19 9	19 3*	19 6
New Modderfontein	247 6†	245 0*	—	
Orange Diamonds	—	0 10*	0 10*	—
Rand Klips	2 6*	2 9*	2 6*	2 6*
Rand Nucleus	—	1 9†	1 5*	-
Randfontein Deeps	3 0*	3 0	3 0	-
Rooiberg Minerals	19 6*	20 0*	20 0*	20 0*
Ryan Nigels	-		1 0*	—
Shebas	3 0†	3 0†	3 0†	3 0†
Simmer Deeps		-	—	1 0*
South African Lands	2 3*			
Springs Mines	11 6*	12 3	12 0*	12 6
Sub Nigels	8 9	--		
Swaziland Tins	20 0*	—		20 0*
Transvaal Coal Trust	27 0*	27 0		
Transvaal Gold Mining Estates	35 0*		35 0	
Van Ryn Deeps	42 6	43 3	44 0	44 0
Village Deeps	--			33 0*
Witbank Collieries		35 6	-	
Witwatersrand Deep	37 0†		37 0†	36 0*
Wolhuters	12 0	12 0	12 0*	12 3*
Zaaiplaats Tins	21 0	21 6	21 6	

*Buyers. †Sellers

*Buyers. †Sellers.

Miscellaneous Dividends.

Company.	Date of declaration.	Rate per cent.	Amount distributed and to be distributed.
Rand Mines, Ltd.	June	110	£
Do.	Dec. 12	90	933,332
Consolidated Investment Co.	June	5	197,500
Transvaal Coal Trust	June 12	7½	
Do.	Dec. 17	8¾	68,220
Pretoria Port. Cement Co.	June	15	
Do.	Dec. 18	15	45,000
New Transvaal Gold Farms	June	10	4,750
Kleinfontein Estate	June	5	
Do.	Dec.	5	8,500
New Era	Dec. 17	10	10,000

Johannesburg Stock Exchange.

The Chairman of the Stock Exchange, addressing the members last week, gave an explanation of certain emergency rules which had been posted on the notice board. He said that the constitution of the Exchange was a cast iron one, and did not permit of any latitude, so that the committee, in dealing with a crisis so unexampled as had been created by the war, had been faced with inability to do anything save under their rules, unless the Government of the Union would confer extra powers. These powers had been granted to the committee, and by virtue of them temporary regulations were passed which would apply for a period of six month from date. These regulations would not please everyone, but they had been framed with the idea of doing justice to all so far as possible. With regard to the question of alien enemy members, he could not say definitely what position the Government would take up, but judging by the action in granting aliens bar and hotel licences, it was probable that brokers' licences would also be granted to any uninterned alien members of the Stock Exchange applying, and in that case the committee and members could not offer any opposition.

INVESTORS' DIARY.

FORTHCOMING COMPANY MEETINGS

Feb 26. Southern Freeholds; South Deeps; East Rietfontein Syndicate.
March 26. Jupiter G.M. Co.; Simmer Deep.

Consolidated Gold Fields Group.

The following are particulars in regard to the outputs and profits for the month of December of the undermentioned companies of the Consolidated Gold Fields group:—

Company.	No. of Stamps.	Tube Mills.	Tons Crushed.	Gold declared. Fine Ozs.	Total Profit.
Simmer and Jack	320	7	65,700	18,294	£36,124
Robinson Deep	130	9	50,300	17,036	27,002
Knights Deep	100	11	95,040	17,854	17,002
Simmer Deep	180	9	58,400	11,833	5,000
Sub Nigel	20	1	4,470	2,218	1,681
Totals	1050	37	273,910	67,235	£86,809

The sundry revenue included in the above total declared profit is as under: Simmer and Jack, £1,800; Robinson Deep, £27; Knights Deep, £357; Simmer Deep, £578; Sub Nigel, £201; total, £2,963.

Reserve Gold: Simmer and Jack, 7,750 ozs.; Robinson Deep, 2,185 ozs.; Knights Deep, 434 ozs.; Simmer Deep, 2,238 ozs.; Sub Nigel, 430 ozs.; total, 13,037 ozs.

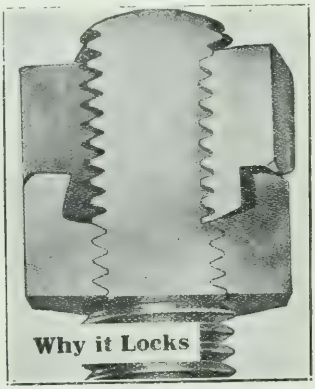
Transvaal G.M. Estates.

The following are the particulars of this company's output for the month of December, 1914: Central Mines: Tons crushed, 10,250, yielding 5,665·829 fine ozs. Elandsdrift Mine: Tons crushed, 660, yielding 810·396 fine ozs. Vaalhoek Mine: Tons crushed, 1,530, yielding 577·802 fine ozs. Estimated value of month's output, £29,394; estimated profit for the month, £11,062. The reduced profit is due to disorganisation caused by soaking rains already reported.

Engineering Notes and News.

The Vislok: A New Nut-Locking Device.

Few mechanical contrivances have received so much attention from engineers as lock-nuts and nut-locking devices. The latest, which appears to be a great advance on previous efforts, is the Vislok. This nut is made up of two sections hydraulically forced together and guaranteed inseparable. It has a solid continuous thread throughout, and for its locking effect depends on the action of a swollen spigot which strives to force more metal into the thread than it will hold. The nut is guaranteed not to work loose under any conditions. It is fool-proof, and can be used indefinitely without damage to thread of nut or bolt. This nut is patented throughout the world, and is made in England. It has been very largely adopted by mining, municipal, railway, and motor car engineers. Vislok nuts in all sizes have been put on the market by Harvey & Russell, Ltd., of this town.



Base Metal Quotations.

On the London Metal Exchange on Tuesday, standard copper was £57 17s. 6d. per ton; electrolytic copper, £61 per ton; Straits tin, spot (scarce), £151 10s. per ton cash, and £145 10s. per ton for three months' delivery; English lead, £19 2s. 6d. per ton.

Causes of Cracking of Reinforced Concrete.

The cause of the cracking of reinforced concrete when the reinforcing material discharges current into the concrete has been found to be the formation of rust upon the anode. In the report of the Committee on Electrolysis of the International Association of Municipal Electricians, Mr. Leon Taylor (the chairman) said the Bureau of Standards found that this formation of rust takes place only at temperatures around 100 deg. Fah., and that damage to the concrete is therefore not to be expected unless the density of the discharge is very high or some other conditions keep the concrete above the critical temperature. The addition of a fraction of 1 per cent. of salt to concrete increases its conductivity and destroys the passivity of the iron, thus multiplying the corrosion many hundred times. Salt should, therefore, never be used in structures that may be subject to electrolytic action. The passage of current from the concrete to the reinforcing material has been found to cause a softening of the bond between the iron and the concrete, due to the accumulation of alkali there. The danger from electrolysis of concrete is greater where the current flows to the reinforcing material than where the current flows from the metal to the concrete. The passage of a current through unreinforced concrete has no effect upon the concrete other than that produced by the heating effect of the current. Electrolytic corrosion seems to be independent of the quality of the iron.

In the course of his last annual report, the general manager of De Beers writes:—" Central Power Station: The erection of the new 6,000 k.w. Westinghouse-Rateau turbo-generator and the new boiler plant was completed at the end of September, 1914. We hope to put these into service about the end of the year (December, 1914). Tramways: We acquired the tramway system of the Victoria Tramways Company on the 1st July, 1914. Penny fares have been introduced in place of the former threepenny fares, the innovation making the travelling the cheapest in the country. The company's workmen are carried to and from work free of charge. Electric Lighting of Kimberley: The current consumption shows a substantial increase. The supply to the Kimberley City Council for the year under review amounted to 897,882 units, as against 768,088 units for the previous year."

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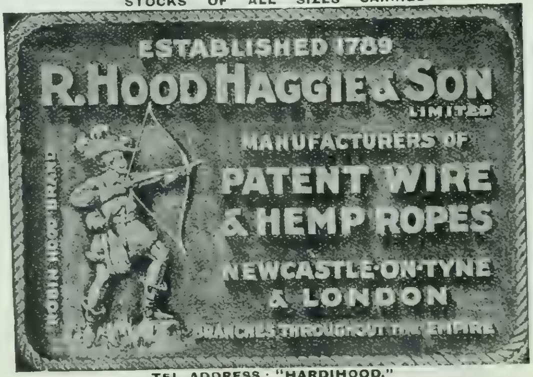

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CENTRIFUGAL v. RECIPROCATING PUMPS.

Successful Centrifugal Pumping Plant at the Durban Roodepoort Deep and Its Lessons—Important Discussion.

A VALUABLE paper was read by Messrs. E. G. Izod and A. D. Roullard, at the last meeting of the S.A.I. of E., on the Centrifugal Pumping Plant at the Durban Roodepoort Deep. In summing up, the authors said:—

There were certain valid reasons why centrifugal pumps were installed at the Durban Roodepoort Deep instead of reciprocating pumps, and it may be of interest briefly to state these reasons. (1) *Initial Cost.*—The capital cost of a centrifugal pumping plant, complete with motor, starter and combined bedplate all delivered in Johannesburg, is approximately 60 per cent. of the cost of a reciprocating pumping plant, assuming conditions similar to those at Durban Deep, which calls for 800 gallons per minute against 2,500 feet head. For a 2,000 gallon per minute plant against 2,250 feet head, the centrifugal pumping equipment becomes 40 per cent. of the cost of reciprocating pumping equipment. (2) *Weight of Plant.*—The centrifugal equipment weighs approximately 70 lbs. per gallon of water pumped per minute. A reciprocating equipment would weigh approximately 350 lbs. per gallon per minute (3) *Reliability.* -This was an unknown figure when the pumps were installed, but the authors were of the opinion that, in spite of a very considerable amount of hostile criticism, the centrifugal pump had i t had fair treatment, and the results of a year's run have confirmed their opinion, as there has been no trouble of any sort experienced with the pumps since they were installed. (4) *Cost of Maintenance.*—This also was an unknown figure, and here again the authors believed that with clean water the maintenance costs could be reduced to a reasonable minimum. The actual figures are given in the early portion of this paper It will be noticed that in the list of spares fitted to the pumps two fliers are included. The authors would like to point out that these fliers were not used to replace worn out parts, but were necessitated by an accident to the old fliers when dismantling the pump for inspection, and it may be of interest to state here that when the internal parts of the pump were inspected there was no sign of wear or scarring on either fliers or guide wheels. (5) *Cost of Excavations for Pump Chamber.* The larger the quantity of water to be handled the bigger the proportional saving by using centrifugal pumps. Taking the Durban Roodepoort Deep plant as approximately 800 gallons per minute capacity, the net excavation for the pump chamber would be, allowing for no further installation of plant, 8,000 cubic feet; for a reciprocating equipment of similar capacity the excavation would be approximately 55,000 cubic feet, or the cubic feet to be shifted for the centrifugal equipment would be approximately 15 per cent. of the cubic feet for the reciprocating pump. For a 2,000 gallon per minute plant the excavation for a centrifugal equipment would be approximately 10 per cent. of the cost of excavations for reciprocating equipment. The figures are shown on the following table, and the authors would state that they took several makers' drawings for the reciprocating pumps before compiling this table, and selected those pumps which occupied the smallest space for their capacity. If the figures given can be improved on in any way, the authors will welcome a correction, as they are anxious to be perfectly fair to both types of plant.

COMPARATIVE SIZES AND COSTS OF PUMP CHAMBERS.

Capacity of Plant. Gallons per minute.	Centrifugal Pumps.		Reciprocating Pumps.	
	Cub. feet of Excavations.	Total cost of Chamber at 6d. per cubic ft.	Cub. feet of Excavations.	Total cost of Chamber at 6d. per cubic ft.
800	8,000	£200	55,000	£1,375
2,000	13,000	325	130,000	3,200

The above are the general points which appeal to the authors as indicating the merits of centrifugal pumps for high lifts, and after a year's experience with the particular plant under discussion there are other favourable features evident which cannot be assessed in cash or figures, such as (1) simplicity of repairs and replacements, (2) smoothness of running, (3) minimum of attention required during operation, and other points which are beyond the scope of this paper. The authors would like here to acknowledge the invaluable assistance given by Mr. Kay, the Resident Engineer of the Durban Roodepoort Deep, who not only supervised the erection of the pipe line and pumping plant, but whose control of the running of the plant has been largely responsible for the success which has been obtained. It will be noted that the authors have drawn particular attention to the importance of settlement of grit, and this opens a new field for investigation into the cheapest way of handling the sand or sludge deposited in the settling sumps. With proper settlement the quantity of material to be handled is quite an item, especially if the water requires much neutralisation, and experiments are now being made to determine the cheapest and simplest method of performing the operation. The authors would welcome a very free discussion on this point, as they feel that the information would be very valuable to all mining engineers, both now and for future reference. During the last few months important extensions have been made at the Crown Mines to the centrifugal pumping plant, and two 1,000 gallon per minute pumps have been ordered for the 13th level concentration scheme, and four 400 gallons per minute pumps for the 19th level. When the specifications for these new plants were drawn up one or

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SOME 1914 RESULTS:—
MANAGERS - - - January and May - - - ALL Passed.
ELEC. ENGINEERS - February - - - - - 66% ,,
MECH. ENGINEERS- June (Kimberley Centre) - - ALL ,,
MINE OVERSEERS - - - - - - Practically ALL ,,
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two rather important features were embodied, and it may be of assistance to the members briefly to refer to these. (1) *Lubrication.*—The ordinary lubrication system used for high-speed motors for driving pumps is not satisfactory, as there is no proper method provided for preventing oil getting into the windings of the motors. In the new plants recently ordered complete oil slinging and catching arrangements are to be provided, using the sams system as has been found efficient for preventing oil getting into the windings of high-speed electrical machinery driven by steam turbines. It is also advisable to have the motor bearings carried on separate pedestals, and not carried on the end shields of the motor. It is then easy to allow a clear space between the bearing housing and the motor end shield, and this, combined with efficient oil slinging and catching device, will completely prevent any oil getting into the machine. (2) It will considerably facilitate handling of the plant if the motor with its bearings is mounted on a separate bedplate, arranged to slide out sideways on the main bedplate carrying the pumps. This particular feature in design applies only to two-cylinder pumps with the motor between the cylinders.

With these remarks the authors conclude their short paper on the Durban Roodepoort Deep pumping plant, and they would like to emphasise that they have not attempted to belittle the reciprocating pump, which has been, and still is, a very faithful friend to all mining engineers. They have tried rather to throw some light on the high speed centrifugal pump as seen from their own experience, and they sincerely hope that members will criticise freely and frankly the statements and figures given in the paper. The pumping question is of growing importance, especially in view of the deeper level working, and the need for concentration, and every criticism will be of value not only to the authors, but to other engineers who may have to consider large pumping installations. The one point they wish to call attention to in the very strongest terms is: Give the pumps clean and neutral water, and, whatever the type of pump, the cost of cleaning will only be an item compared with the saving in running costs and the maintenance of efficiency.

The President: I think the authors are sincerely to be congratulated upon the excellence of their paper. It deals with a subject, which, as they say, is of very great and growing importance to the mining industry, it being the sort of paper which this Institution cordially welcomes. He felt sure that there would be prolonged discussion. Years ago some of these centrifugal pumps were tried with more or less poor results. To-night they had heard of the exact feeling of gentlemen who had had charge of the installation and the running of the plant for at least a year. Some of the arguments they brought forward would require careful handling, but the advocates of the reciprocating side will naturally come up in formidable array. He hoped members would state all they know about pumping plants, because as the authors say, there is a great work in front of all in regard to the concentration of pumping schemes on the Rand; and the success of such concentrations will to a large extent depend upon the methods adopted and the material and machinery employed. If centrifugal pumps eventually prove to be the better, they will doubtless be used; but he thought that after long and careful debate they would be in very much the same position as things at present in Flanders more or less at stalemate. Every one who had carefully studied the subject had his opinions, and he hoped they would freely be expressed, so that a very interesting and carefully thought-out discussion would be the result. He had great pleasure in proposing a very hearty vote of thanks to Messrs. Izod and Rouillard for the work they had given the Institution: he was sure that all present would cordially agree with him in moving that vote.

Mr. J. G. Lawn said he had listened with great interest to the paper, and thought it was a particularly valuable contribution to the transactions. This question of pumping had not been very carefully followed on the Rand. One's thoughts went back to the pumping of mines many years ago. It was really the necessity of the miner which gave rise to the invention of the steam engine, and it was the pumping work on the mines in Cornwall which did more than anything else to evolve an economical type of steam engine. The miner could not mine at all, other than to a shallow depth, before steam engines were invented. Now in Cornwall, after the engineers had got to work on the pumps, there was a tremendous amount of competition, and the result was that the most remarkable efficiencies in pumping engines were secured. What was done was this: They had a monthly record of every pump working in the country. There was a man whose duty it was to go round, carefully take the coal consumption, and the work done. Tables were published, and the degree of interest and enthusiasm which was awakened in the minds of Cornish engineers can well be imagined. This resulted in very great economies and efficiencies which may not be improved even to-day, because it is claimed here that, as far as the centrifugal pump goes, efficiency is not its particular strong point. On the Rand the question of pumping has always been of very secondary importance. It is quite easy to see why this is so. Mining started on the Rand when engineering had advanced to a very considerable degree, and the miner on the Rand was practically never troubled with water. A good many engineers would have liked to have had more pumping to do at certain seasons of the year than they had. Appliances could be bought by the dozen, compressed air, Cornish plants and electric pumps. A great variety of pumps was available from which the engineer chose, often without very careful considerations of efficiency or of addition to working costs, but simply because they suited his immediate purpose. Now if there were published monthly statements of efficiencies or cost of pumping, if it were emphasised as it was in Cornwall, one could quite understand that pumping would have been a great deal more efficient in the past than it has been. It is just this sort of paper that stimulates interest and leads all to look at home and see whether their own arrangements are all that they might be. He was particularly pleased at the emphasis laid by the authors of the paper upon cleanliness and light in an underground pumping station; and of course that would apply to other arrangements underground. These are very often neglected. It is not always easy to keep these places clean and well ventilated or well lighted; and there is no doubt that cleanliness, light and ventilation do tend to efficiency and care. He was quite sure that care in these details was a very good feature in the pumping station that had been described. One would be inclined to ask, why is it that these high-lift centrifugal pumps have not been used more on the Rand? In other countries they have been used to a great extent. He remembered some years ago visiting a colliery in Wales and seeing them pulling out a good compound engine and installing a centrifugal pump. He could not at the time understand it, but conditions there were very different from what they are out here. When he enquired he found the reason was that they had coke ovens and got a tremendous amount of gas as a by-product. They ran gas engines and had any amount of electric power at a very cheap rate. It was not that the centrifugal pump, on the basis of power consumption, was cheaper than the pump they were pulling out. With respect to the Rand he thought this style of pump had not perhaps received sufficient attention; because, although the quantity of water to be dealt with was not great, speaking for the average mine on the Rand, yet it was important. That is to say, one might have a comparatively small amount of water to deal with and the total additions to the working costs per month be comparatively small, but the pump must be reliable. In other words, if the pump were to fail, one would lose more by delay in not being able to keep the mill going than any possible saving one might make in buying a type of pump that was going to work a little cheaper. In fact, there was a certain element of risk in the earlier designs of these centrifugal pumps, and although there might be many factors to recommend them, the element of risk was perhaps not wise to take. There is no doubt that many of these early centrifugal pumps were not all they ought to have been. He remembered a case of a mine in Cornwall where they had to pump water—it was an old mine filled with a large amount of clean water—and they tried a certain type of centrifugal pump which was quite a failure. The pump and motor were not well proportioned, and the arrangements broke down. They did not get things going until they installed a Sulzer pump. Now, that is one reason why centrifugal pumps did not make more rapid headway—they were not all well designed, and people became a little suspicious of them. Then, as the authors have explained and shown at great length, there is grit in a mine. Although it is very important to settle it in dealing with reciprocating pumps and the cleaner the water is the more satisfaction will be obtained from any pump installed, yet perhaps there will be more danger of a breakdown with a centrifugal pump than with the ordinary reciprocating pump, provided the water was not quite clean. But if a reliable design of pump is secured, and if care is taken thoroughly to settle the water, and to ensure that there is no possibility of grit getting into the pump, there seems to be no reason why these pumps should not be much more largely adopted in the future than they have been in the past. He had pleasure in seconding the vote of thanks to the authors for their interesting and profitable paper.

(*To be continued.*)

Pniels, Ltd.

The first annual general meeting of shareholders in Pniels, Ltd., was held last week. The directors' report, *inter alia*, stated:—"The company was registered on the 7th August, 1913; the accounts therefore deal with the period from that date. The authorised capital of the company is £125,000 in 125,000 shares of £1 each, of which 60,000 shares have been issued to the shareholders of the Pniel Diamond Mining Company, Ltd. (in liquidation), as fully-paid up, and 40,000 shares have been subscribed for at par, the balance (25,000 shares) being held in reserve. The company holds prospecting and mining rights over the Berlin Mission Society's property, consisting of 29,422 morgen, together with all plant, buildings and machinery taken over from the Pniel Diamond Mining Company, Ltd. (in liquidation). Since the inauguration of the company, our water service has been considerably extended. Prospecting for further alluvial deposits has been carried on extensively during the year, and it is hoped that the knowledge gained will prove profitable in more propitious times."

Cape Copper Co.

Further dividend of 3½ per cent. on the preference shares, making the full distribution of 6 per cent. for the year. The directors regret that there are not profits available for a dividend on the ordinary shares.

Commerce and Industries.

Natal Coal Trade.

Several of the Natal collieries report that the coal trade has been very satisfactory, and that the demand is rather overtaking the supply, with the result that more trucks have been wanted. These, however, have not been forthcoming. Altogether there appears to be a certain amount of brightness in the situation which has been non-existent in the immediate past, and a very hopeful view is now taken of the trade. The exports during the six days ended December 26 amounted to 19,949 tons, of which 6,346 tons were shipped at the Point. The stocks amounted to 20,710 tons, which will be considerably reduced by the mail steamer's loading.

* * * *

Another Opportunity for British Colonies.

Tanners, and consequently manufacturers of boots and all leather goods (says an Imperial Institute communique) are faced by a serious situation owing to the difficulties caused by the war in obtaining tanning extracts. Last year the value of tanning extracts of all kinds imported into the United Kingdom reached £922,600. Supplies from Italy have now been wholly, and from France partially stopped, owing to the increased demand for military purposes in those countries. Quebracho wood extract, a well-known tanning material, is arriving in fair quantities from South America, but with the higher freight and insurance and the increased demand, the price is bound to rise materially. The supply of valonia, one of the most favourite tanning materials, extracted from the acorn cups of the Turkish oak, is cut off by the entry of Turkey into the war field, and a substitute is urgently needed. Fortunately the British colonies should be able to fill the gap, both South Africa and, in a lesser degree, the Commonwealth of Australia having for some years done a considerable export trade in wattle-bark, while East Africa is also now in a position to begin sending shipments. The value of wattle-bark for tanning has been sufficiently demonstrated by a series of experiments conducted at the Imperial Institute, where samples of the bark from British colonies and of leathers tanned with it may be inspected. Wattle-bark has been used moreover and highly appreciated for some time in Germany, where, curiously, the bulk of the supply forwarded to Europe from the British colonies has hitherto been ultimately sent. As a large and constant supply is available at a price which is very cheap as compared with that of valonia (which wattle-bark should be able to replace), it is to be hoped that wattle-bark will now be regularly used by British tanners. A difficulty in the way hitherto has been the absence of factories for preparing the bark extract in the country of origin, but this defect is, in the case of South Africa at all events, apparently about to be removed. It is to be hoped that British tanning extract makers will also give their attention to this side of the question.

* * * *

Iron and Steel Trades.

For the third time since the commencement of the war the price of steel in Great Britain has been advanced, a rise of 5s. per ton having been instituted by the English Steel Makers' Syndicate a few days ago. . . . Shipbuilders' requirements have been very heavy of late, and are likely to continue so. Activity in the iron and steel industry appears, indeed, to be assured, at least until next spring, while business is already being booked for dates further ahead. . . . There have been various indications of late of growing confidence in the future among iron and steel producing companies, and the fact that so many of them have recently declared interim dividends on the same scale as at this time last year, while in one case a first interim distribution has been announced for many years, renders it practically certain that for the current twelve months the total return on the capital of most of these companies will not be less than for 1913-14, and may be more. The point upon which iron and steelmasters lay most stress just now is that the recent elimination of German competition may be regarded as likely to remain operative for probably a decade. The only adverse development which seems likely to arise at present is a shortage of labour owing to the requirements of the army for precisely the class of man who is indispensable to mining and smelting operations.

South African (Vryheid) Coke.

At an extraordinary general meeting of the above-named company held on the 19th November, 1914, resolutions were passed to the effect, *inter alia*:—That it is expedient to sell the undertaking property and assets of this company to the Vryheid Coke Company, Ltd., and that with a view thereto this company be wound up voluntarily.

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Companies Registered.

COMPANY REGISTRATIONS AND INCREASES AND DECREASES OF CAPITAL.

4393. Rand Livestock Auctioneers, Ltd., Johannesburg: increased from £1,000 to £5,000.
1429. Vaal River Salt Works, Ltd., Johannesburg: increased from £4,000 to £5,000.
3856. Matamba Minerals Co., Ltd., Johannesburg; increased from £10,000 to £11,000.
1680. Witwatersrand Native Labour Association, Ltd., Johannesburg: reduced from £60,926 to £59,754.

SPECIAL AND EXTRAORDINARY RESOLUTIONS.

3485. Stock and Property Agency, Ltd., Johannesburg: raising of loan.
4485. Gabriel and Broom, Ltd., Johannesburg; change of name.
4502 W. T. Forshaw, Ltd., Johannesburg: change of name
3871. The Union Steel Corporation of South Africa, Ltd., Vereeniging; preference shares and amendment of articles
4209. South African Diamond Corporation, Ltd., Vereeniging; amendment of articles.
4116. Hotel Imperial, Ltd., Vereeniging; liquidation.
1473. Chittenden and Co., Ltd., Vereeniging; liquidation.
2992. The Nile Valley Gold Mining Co., Ltd., Vereeniging; liquidation.
1879. The South African Land and Exploration Co., Ltd., Vereeniging: amendment of articles.
2312. Wallach Printing and Publishing Co., Ltd., Pretoria: amendment of articles.
4499. Hanover Rubber Co., Ltd., Johannesburg; change of name.
1217. Steynskraal Gold Mining Co., Ltd., Johannesburg; reduction of capital.
4321. The Victoria Land Co., Ltd., Johannesburg: raising of loan.

THE FOLLOWING COMPANIES HAVE BEEN PLACED IN LIQUIDATION.

4116. Hotel Imperial, Ltd., Johannesburg; voluntary.
4473. Chittenden and Co., Ltd., Johannesburg; voluntary.
2992. Nile Valley Gold Mining Co., Ltd., Johannesburg; voluntary.
3630. Benoni Venture Syndicate, Ltd., Benoni: by order of Court

NOTICES OF CHANGE OF ADDRESS.

2516. African Share Agency, Ltd., Stands 227 and 231, Marshall's Township, 4, Aegis Buildings.
2791. Empire Diamonds, Ltd., Stands 227 and 231, Marshall's Township, 4, Aegis Buildings.
2442. West Rand Steam Laundry, Ltd., 6, Monument Street, Krugersdorp.
2638. Witpoortje Estates Syndicate, Ltd., 6, Monument Street, Krugersdorp.
4064. Inter-Colonial Building Society and Investment Corporation, Ltd., No. 1, Permanent Buildings, Harrison Street, Johannesburg.
4166. East Rand Board of Executors and Trust Co., Ltd., No. 5, Jeppe Arcade, Johannesburg.
4145. Price's (South Africa), Ltd., C/o A. H. L. Burmeister and C. G. Price, both of Carr Street, Newtown, Johannesburg.
4468. The Spies Tributing Syndicate, Ltd., cor. Kruger and Joubert Streets (Erf 49), Piet Retief.
4100. Ferreirastown Buildings, Ltd., Sacke's Buildings (1st floor), Commissioner and Joubert Streets, Johannesburg.
3948. Gibraltar Land Co., Ltd., No. 5, Primrose Buildings, Fraser Street, Johannesburg.
4255. Abantu-Batho, Ltd., c/o Pixley Ka Isaka Seme, Sophiatown, Johannesburg, and Cleopas Solomon Mabaso, cor. Rissik and Anderson Streets, Johannesburg.

FOREIGN COMPANIES CEASED TO CARRY ON BUSINESS IN THE TRANSVAAL.

4240. Primus Diamonds, Ltd.
3326. The Pniel Diamond Mining Co., Ltd.

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O.F.S. Diamonds.

The fifteenth ordinary general meeting of shareholders in the Orange Free State and Transvaal Diamond Mines, Ltd., was held on Monday. Mr. James H. Crosby presided, and in moving the adoption of the report and accounts said: I need not dwell on the causes which account for the present parlous state of the diamond market, and you will quite understand the impossibility of our doing anything in present circumstances. Even if the necessary funds for the further development of the mine were obtainable, it would be very unwise to start work until the price of diamonds was re-established. Expenditure has been cut down to a minimum. Out of a total of £2,206 for the year, claim licences and leases account for £976; caretaking of the property and maintenance of machinery (which is in good order), cost £610; the necessary expenses connected with the share transfer agencies in Johannesburg, London and Paris came to £275, and the balance of £347 is detailed in the accounts. No directors' fees have been either drawn or credited during the period. I now beg to move the adoption of the directors' report and statement of accounts for the year ended 31st October, 1914.

United African Lands.

For the year ended September 30, 1914 the directors report that the South African administrative expenditure was £419, against £901 the previous year. A further reduction is anticipated. The London expenditure also shows a small reduction. The liabilities to bankers and others have been reduced from £12,170 to £11,367. Instalments for land sold will enable further payments to be made off the loan account during the coming year. Numerous offers for small farms or portions of farms have been received during the past twelve months, but the prices offered have not been sufficiently high. Negotiations are at present proceeding with regard to the sale of 4,900 acres of land. Ultimately the company should be able to free itself from debt, and have a considerable surplus of land assets for realisation or development. In the Waterberg district the block of ten farms, consisting of about 34,000 acres, is worth, the directors have been advised by Mr. Cochrane, not less than £17,000. The farms in the vicinity of the township of Middelburg, of about 16,500 acres, were valued by him at not less than £16,500. In addition to the above the company owns about 121,000 acres in various districts of the Transvaal. The profit and loss account for the year shows a debit of £831, increasing the previous balance to £55,515.

East Rietfontein Syndicate, Limited.

(Incorporated in the Transvaal.)

NOTICE TO SHAREHOLDERS.

NOTICE IS HEREBY GIVEN that the Eleventh Ordinary General Meeting of Shareholders of the above Syndicate will be held in the Board room, Consolidated Gold Fields Buildings, Simmonds Street, Johannesburg, on FRIDAY, the 26th FEBRUARY, 1915, at 11.30 o'clock in the forenoon, for the following purposes:

1. To receive the reports of the Directors and Auditors, and to consider the Balance Sheet at 31st December, 1914, and Statement of Income and Expenditure from 1st January, 1914, to 31st December, 1914.
2. To elect Directors in the places of Messrs. D. Christopherson, J. Friedlander, H. Neuhaus, W. S. Smits, F. Leslie Brown, and Sir E. H. Dunning, who retire from office in accordance with the provisions of the Articles of Association, but are eligible, and offer themselves for re-election.
3. To elect Auditors for the current year, and to fix the remuneration for the past year's audit.
4. To transact such other business as may be transacted at an Ordinary General Meeting.

The Transfer Books of the Syndicate will be closed from 19th to 26th February, 1915, both days inclusive.

By Order of the Board.

THE CONSOLIDATED GOLD FIELDS OF SOUTH AFRICA, LIMITED,
Secretaries.

Per A. C. GRANT.

Head Office:
Consolidated Gold Fields Buildings,
Simmonds Street, Johannesburg.

6th January, 1915. 42624

THE SOUTH AFRICAN

Mining Journal,

WITH WHICH IS INCORPORATED

South African Mines, Commerce and Industries.

ESTABLISHED 1891.

VOL. XXIV., PART I.] JANUARY 16, 1915. [No. 1216.

HEAD OFFICE: 176-180, Stock Exchange Buildings, Fox Street (2nd Floor), Johannesburg, Union of South Africa.

Telephone **913.** P.O. Boxes **963** and **418.**

Cable and Telegraphic Address: **"MINING JOURNAL."**

AGENTS FOR GREAT BRITAIN: Argus Printing and Publishing Co., Ltd., Byron House, 82-85, Fleet Street, London, E.C.

AMERICA: Advertisements accepted from any recognised Advertisement Agency.

ANNUAL SUBSCRIPTION RATES: Oversea, £2; South Africa (by post), £1 10s.; Local Delivery (Town only), £1 6s.

Copies of this journal are obtainable at all Branches and Agencies of the Central News Agency, Ltd., at all News Agents and Railway Bookstalls throughout South Africa, and at the London Agency as above.

NOTICE.—The postage of this issue of the *S.A. Mining Journal* is: South Africa, 1d. All other parts, 1½d.

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Notes and News.

Village Main Reef. The quarterly report of the Village Main Reef shows that, compared with the quarter ending June, the results compare favourably. The tonnage milled increased 7,450 tons, working costs were lower and the total profit higher. The value of the ore milled was better, but the yield rather lower owing to the temporary measure of conserving zinc in the cyanide works during August and September, when supplies were uncertain. The extraction is again normal. The tonnage of sand filled into old workings was 25,217 tons. A plant for spraying the tailings dumps has been installed, and is successful in allaying the nuisance created by sand on windy days.

* * * *

United States Diamond Imports. Because of the war, the gem imports to the United States for 1914 will be the smallest for many years. According to an estimate made by a Maiden Lane authority they will not reach $20,000,000—less than one-half of the total in a normal year. Figures compiled by William B. Treadwell, jewellery examiner at the Appraisers' Stores in New York City, show that the gem imports for the first eleven months at the port of New York totalled only $16,208,679. It is estimated that about four-fifths of the receipts for the entire country enter through this port. The total imports for 1913 reached $46,137,328, and in 1912 the total was $40,571,543. The trade is now at a standstill.

* * * *

New Coch. The New Coch Company has outstanding £112,475 of 5 per cent. debentures, and the directors give notice that, in addition to the instalment of £26,250 to be paid off on July 1 next at a premium of 8 per cent., the balance of issue, £86,225, will be redeemed on the same date at a premium of 10 per cent. The trust deed gives permission for such a step to be taken. While the debenture-holders will receive back their capital at an earlier date than might have been expected, shareholders may perhaps complain that the return of the company to the dividend list is being postponed. It depends upon the point of view, of course, and who hold the debentures; but the elimination of the debentures should pave the way for the division of profits as long as there are any to divide. The company is now earning at the rate of well over £120,000 per annum.

* * * *

Cinderella Consolidated. At the recent annual meeting of the Johannesburg Goldfields Co., the chairman made some interesting remarks concerning the immense possibilities of the Cinderella Consolidated. He explained that with further funds, required for the completion of shaft sinking and development on a large scale, this would permit of a reduction of working costs to a more normal level and that it would be possible to formulate some suitable scheme for the provision of these funds within the period during which interest and redemption payments had been deferred. He pointed out that the average recovery value of the ore treated since the beginning of operations amounted to nearly 28s. per ton, but that the abnormal difficulties under which the mine had been worked had gradually driven the working costs up from about 22s. per ton in its early stages to about 30s. per ton just prior to the closing down of operations. This increase in the working expenses was, indeed, the cause which necessitated the suspension of crushing; but, in view of the fact that there were 600,000 tons of ore fully developed in the mine from which an average recovery value could be expected, there was every reason to assume that on the completion of the programme outlined working costs would be brought down to a level which would enable the resources of this huge property to be worked at a handsome profit. "This," he added, "represents practically the exact words used by the chairman at the meeting in question, and my excuse for repeating them is the comparatively large interest which your company has in this mine."

Cape Copper.

In presenting accounts for the year ended April 30, 1914, in the colony and to August 31, 1914, in London and India, the directors of the Cape Copper Co. state that the net profit is £17,244, to which must be added £60,757 brought forward, making £78,002. From this sum £2,825 has been set aside for English income tax, £2,648 for colonial income tax, and £63,375 has been paid in dividends. There remains £9,153, out of which a final dividend of 3½ per cent. (making 6 per cent. for the year), subject to income tax, on the preference shares, has been declared, payable on January 1, 1915. The directors regret that there are not profits available for a final dividend on the ordinary shares. Owing to the re-arrangement of the smelting plants a considerably smaller output of copper than in the previous year has been returned, and the general cost of production has increased. Lower prices for copper have ruled during the year, affecting not only the output, but also the realisation of the stocks brought over from the previous year. The present accounts also compare unfavourably with those of the preceding year in respect of receipts from the Tilt Cove establishment, which practically ceased in that year. The stock of copper ores has been valued at cost or market price and the stock of refined copper at the prices at which it was sold. Since the close of the year the returns from the smelting works in the colony have shown marked improvement, but the work has recently been impeded owing to the war and the rebellion. The Rakha Hills Mines will add considerably to the company's output of copper, although some time must elapse before the plant will be ready to treat the large tonnage already developed. The capital has been increased by 100,000 ordinary shares of £2 each, of which 60,000 shares have been issued to the shareholders. The directors propose to pay the underwriting and other incidental expenses of this issue out of the reserve fund, *i.e.*, out of undistributed profits, and not out of capital.

* * * *

New Trading with the Enemy Law.

The Trading with the Enemy Act (1914) Amendment Act, which passed through all its stages in the Imperial Parliament in mail week, constitutes a custodian of enemy property—the Public Trustee in the case of England and Wales—to whom dividends and other moneys which fall due to aliens during the war may be paid. The custodian is then at liberty to deposit the money with a bank or invest it in securities approved of by the Treasury. Where money had been paid into an account with a bank, or paid to any person in trust for an enemy, before the passing of the Act, the person or firm by whom the payment was made must give notice within 14 days requiring the money to be paid over to the custodian. Companies, whether incorporated in the United Kingdom or not, which have a share transfer or share registration office there, must communicate to the custodian "full particulars of all shares, stock, debentures, and debenture stock, and other obligations of the company which are held by or for the benefit of an enemy." The Act gives power to a judge of the High Court to vest in the custodian any property of an enemy upon the application of a creditor or any person otherwise interested. Section 6 of the Act makes the assignment of debts by an enemy invalid. The person to whom such an assignment is made will have no rights or remedies against the debtor unless he is able to prove that the assignment was made by leave of the Board of Trade or before the war began. Similarly [section 8 (1)] no person is to have any rights or remedies in respect of a transfer of securities made by or on behalf of an enemy, unless the transferee can prove that the transfer was made before November 19 in good faith and for valuable consideration. The Act places a restriction on the incorporation of new companies by forbidding the Registrar of Joint Stock Companies to give a certificate of incorporation with (a) a statutory declaration by a solicitor engaged in the formation of the company that the company is not formed to acquire the whole or any part of the undertaking of a person, firm, or company, the books and documents of which are liable to inspection under sub-section (2) of section 2 of the principal Act; or (b) a licence from the Board of Trade authorising the acquisition by the company of such undertaking.

Luipaardsvlei.

The annual report of the Luipaardsvlei Estate Company shows that by improving the extraction to 96·22 per cent., a slightly lower grade of ore crushed during the twelve months ended with June yielded 3d. per ton more at 23s., offsetting the rise in costs of 3d. per ton to 18s. 6d. Despite the occurrence of the two labour strikes, the quantity of ore treated was larger at 204,980 tons by 8,200 tons. The profit from the mine expanded £1,776, to £27,774, but, as sundry revenue was not quite so good, the net profit of £38,786 exhibits an increment of only £1,421. Perhaps the most satisfactory feature of the year's work is the addition to the fully-developed payable reserves of 78,570 tons, making a total of 660,365 tons, the average value being a shade less at 5·49 dwts. All development expenditure, with the exception of £496, has been charged to costs, and the ore reserves now stand in the books at 1s. 5d. per ton, against 2s. 9d. allowed for redemption. By withholding a dividend the cash resources exceed liabilities by £37,019. The capacity of the plant has been enlarged to 21,000 tons per month.

* * * *

Champ d'Or French Gold Mining.

Following the general meeting of Le Champ d'Or French Gold Mining Co., Ltd., in Paris on December 24, an extraordinary general meeting will be held, to which will be submitted a resolution confirming a conditional agreement, dated December 9, 1914, between the company and the French Western Exploration and Reduction Co., and authorising the directors to pass to debit of profit and loss account £9,271 10s. 6d. on account of the debt due to the company by the French Western Exploration and Reduction Co. It will also be proposed that the capital of the company be reduced from £135,000, in 135,000 shares of £1 each, of which 134,591 shares have been issued and are fully paid up, to £40,500, in 135,000 shares of 6s. each, by cancelling £94,213 14s., representing 14s. per share upon 134,591 shares, as lost and unrepresented by available assets, and by cancelling £286 6s., representing 14s. upon 409 shares not issued. Should these resolutions be duly passed the directors will ask for powers to increase the capital to £89,000 by the creation, first, of 131,666 ordinary shares of 6s. each, ranking *pari passu* with the reduced ordinary capital of £40,500; and, secondly, of 180,004 deferred shares of 1s. each, conditional upon the sanction of the court being obtained to the resolution for a reduction of capital.

* * * *

New Lisbon-Berlyn.

The report of the New Lisbon-Berlyn, Ltd., for the period of eighteen months ended 31st March, 1914, presented at the recent meeting, states that, as reported at the last meeting of shareholders, regular milling operations ceased early in 1913, the reserves of oxidised ore having become exhausted. Subsequent operations during the period under review were directed exclusively towards developing the pyritic ores, of which the existence of large quantities has now been definitely proved, and towards experimenting upon their metallurgical treatment. The extension of the Government railway to Graskop, which terminus is situated within a few miles of the mine, was completed in May last. This will render possible the profitable treatment of the pyritic ores which, in the past, owing to the high cost of transport of coal required for roasting purposes, could not be contemplated. The treatment of large representative samples of the ore was carried out at the works of the Piggs Peak Development Company, Ltd., and has more than confirmed the experimental results previously obtained on smaller quantities. The operation at the company's properties, both mining and metallurgical, have been under the charge of Mr. Harold Sharpley. On the 3rd March Mr. Sharpley estimated the gross value of the ore available, after allowing for loss in extraction, as £148,745, containing a net available profit value of £59,397. Further work undertaken since that date has opened up additional ore reserves, and to the 8th August last Mr. Sharpley stated that he estimated the available ore reserves as 103,013 tons of a total recoverable value, after allowing for loss in extraction, of £167,765, and showing a total estimated profit of £65,404. In order to make these ore reserves available, it will be necessary to provide approximately £30,000, which will include the cost of an electrical power plant for which the waterfall on the farm Lisbon will be utilised. At the same time, it will be necessary to deal with the considerable advances which this company has received from the H. E. Proprietary (New), Ltd. Plans and estimates for the new plant have been prepared, and a scheme for providing the necessary funds was practically completed when the outbreak of war put a stop to the negotiations. It is now the intention of the directors, at the earliest possible moment, to lay before shareholders, for their approval, a scheme for the re-organisation of the company's finances, so as to enable the new work to be taken in hand at an early date.

* * * *

Bwana M'Kubwa Copper Mining.

The financial position of the Bwana M'Kubwa Copper Co. at June 30, 1914, was as follows:—Cash, £48,146; debtors, £8,972; estimated net value of concentrates unrealised, £9,000—£64,118. Less creditors, £3,985; leaving a balance of £60,132. Administration and general expenses in London amounted to £2,667 for the year, from which has been deducted receipts in respect of interest and transfer fees during the same period of £1,827, leaving a balance of £840. In view of the very extensive development work already accomplished in the mine, and of the large tonnage of ore opened up, it has not been necessary during the year to incur any considerable further expenditure in this direction. The total development footage now amounts to 12,841 ft. The concentration plant has been in continuous operation during the year, and during that period a total of 2,251 tons concentrates containing 1,046 tons of copper was produced. During the year 2,214 tons of concentrates have been shipped and have realised £56,964. Since June 30 to September 10 further concentrates have been shipped and have realised £56,964.

* * * *

Transvaal Gold Trust.

The report of the Transvaal Gold Trust, Ltd., for the year ended 30th June last, presented at the recent meeting, states that during the year the ore treatment plant was completed. This commenced the treatment of the accumulation of the low grade development ore at surface in October last, and ran intermittently owing to the shortage of labour and usual difficulties in getting a new plant running. The average grade of the ore in the mine was estimated by Mr. Goodwin in his report of 6th October, 1913, at 8 dwts. per ton, and the crushings put through show that, allowing for absorption on the new plant and loss in treatment, the bulk treated was gradually approximating to the estimated value. Unfortunately, the protracted drought was broken by a period of heavy rains, and the workings were flooded in March and April. Mr. Goodwin, who, in consultation with Mr. Hallimond, had been called in, advised that all capital expenditure should be stopped until conditions improved, and that work for the time being should be confined to prospecting the overlying reef. Since crushing was stopped the plant has been put in thorough order, so that it can be re-started at short notice. Practically all the serious expenditure has been incurred, and the directors, after consulting the larger shareholders, now propose asking the shareholders to assist in placing the undertaking upon a sounder financial footing. It is proposed to wind up the present company and to register a new company with a capital of £80,000, in shares of 10s. each. Of this capital the holders of the existing £100,000 ordinary share capital to be entitled to an allotment of one share of 10s., credited with 7s. paid up, for each existing £1 share. The liability of 3s. per share to be payable—6d. on application and the balance in five calls of 6d. each, with three months' interval between calls. It is further proposed to ask the holders of the existing seven per cent. debentures to accept debentures bearing 6 per cent. interest in the new company in lieu thereof, and to offer the sundry creditors shares at par for the amount of their claims, estimated at £30,000. If this scheme is approved by the various interests concerned and successfully carried through it should provide £10,000 further working capital, which should be adequate to prove the new discovery and to bring the company to the profit-earning stage.

TOPICS OF THE WEEK.

THE SIGNIFICANCE OF THE TRANSVAAL GOLD OUTPUT.

Though the gold output of the Transvaal for 1914 falls short of that for 1913, there is reason to believe that it has more than maintained its relative importance in the list of contributions to the world's gold production in the year. The output of Russia has, doubtless, been interfered with by the mobilization of her forces, and Mexico, owing to internal disorders, has likewise made a poorer showing. "Other countries" have doubtless been affected by the war, and though it is still too early to attempt to compare the actual figures, it is reasonable to believe that the Transvaal will approximate as before to 40 per cent. of the total world's gold output. Rhodesia, of course, has done even better than usual in this respect, and an aggregate output value at £4,000,000 is confidently expected. The following table shows the gold output of the world during 1913:—

Country.	Value.	Percentage of Total.
Transvaal	£37,358,000	40·0
United States	18,144,000	19·4
Australasia	10,758,000	11·5
Russia	5,137,000	5·5
Mexico	4,163,000	4·5
Rhodesia	2,931,000	3·1
Canada	2,743,000	2·9
India	2,493,000	2·7
West Africa	1,689,000	1·8
Other countries ...	8,000,000	8·6
Total	£93,416,000	100·0

Segregating countries and figures relating to the British Empire, we arrive at the following calculations:—

Country.	Value.	Percentage of Total.
Transvaal	£37,358,000	40·0
Australasia	10,758,000	11·5
Rhodesia	2,931,000	3·1
Canada	2,743,000	2·9
India	2,493,000	2·7
West Africa	1,689,000	1·8
Total	£57,972,000	62·0

Assuming that these proportions are maintained, Great Britain, with the high seas under her command, can thus continue to import nearly two-thirds of the world's output from her own Dominions. It will be noticed that Russia, our ally, stands fourth on the list of countries and continents, so that the Triple Entente may be said to control nearly seven-tenths of the output. The United States, which produces 19·4 per cent. remains neutral, and neither from that country nor from Mexico (4·5 per cent.), nor from any of the "other countries" can Germany expect to receive any supplies. Germany contains no gold mines, and the one or two small producers in the territory of her ally, the Austro-Hungarian Empire, are insignificant. So much for the value to the Empire of the gold output of the Transvaal. What the whole mining industry means to South Africa may also usefully be emphasised. Of the total exports of South Africa in 1913 raw gold furnished £40,476,600 and diamonds £12,019,763, being together 77·3 per cent. of the total produce exported. The revenue derived by the Union Government directly by tribute or taxation from the mining industry for the financial year ending March 31st, 1913, was estimated at £2,359,263. The salaries and wages earned during 1913 in the gold and coal mines of the Transvaal amounted to £13,926,431, and the stores purchased for consumption by the gold mines during the year ending December 31st, 1913, showed a value of £10,579,712. Mr. Leisk, the Secretary of the Finance Department of the South African Union, recently stated as his deliberate opinion that it would not be by any means an exaggeration to regard 60 per cent. of the revenues of the South African Union as being directly or indirectly attributable to the mining industries, leaving only 40 per cent. as the yield from all other sources. Speaking broadly, the mining industries provide four-fifths of the total exports of South Africa and three-fifths of its revenue. The Dominions Commissioners estimated that three-fourths of the mining revenue, or 45 per cent. of the total revenue of the whole country, comes from the Rand. In other words, out of a total Government revenue amounting to about £27,000,000, derived from taxation and mining receipts, the Rand contributes about £12,000,000. This compares with £8,000,000 paid to shareholders and £8,000,000 paid to white miners and other white employees. The stoppage of the diamond industry has thrown into strong relief the success which has attended the efforts of the gold industry to carry on as usual. Thanks mainly to the British Navy, the dark forebodings expressed in high quarters at the beginning of the war have not materialised. In opening the Transvaal Provincial Council in August, it may be remembered that the Administrator said: "It was clear people had no idea of the gravity of the situation. No man could say how long the present state of things would last. There was no doubt the diamond mines would have to shut down, and that would affect the Union at once. The gold mines would go on working a certain time, perhaps the whole time, but there would be no profits and no profit tax. In a state of war there would be no importations, and the railway revenue would be affected. There was then the question of public works, to carry on which they relied on loan funds. There would be no fresh loan funds forthcoming. It would be impossible to get the necessary money in Europe. There was no money to go in for fresh expenditure, and they did not know when they might get it. He was not painting an alarm picture, but they should know the position." In painting this dismal picture, the Administrator reckoned without the British Navy, to which we ought indeed be grateful for the fact that after five months of war with a local rebellion thrown in, the gold mining industry of the Transvaal is still going strong. While the economic heart of the country thus continues to beat normally and steadily, we need have no fear of the future.

HOPE FOR THE FAR EAST RAND.

There is reason to believe that the great Government-owned gold-bearing areas of the Far East Rand are at last coming into their own, and that steps are being taken to render them productive. The immediate cause is, doubtless, the necessity for broadening the basis of taxation. It will be remembered that General Smuts, in replying to the debate on the Budget last year, said: "All those Far East areas would have to be worked, *and he thought it would be good for the Government not to be long before making a start with some of them. He hoped it would be possible to make a start in time to overtake the wastage in the present producing mines.*" The italics are ours. Again, the remarks of the Dominions Commission on the subject, which were overshadowed by the outbreak of the war, may be recalled. The report of that Commission said: "We wish to call particular attention to the importance of the Government interest in the undeveloped area. This area lies mainly in the East Rand, and the Chamber of Mines points out that out of 86,000 claims there the mining rights in four-fifths are vested in the State. It is thus clear that the Government, in addition to deriving a large present revenue from the gold-mining industry, has a deferred interest of immense importance in the development and extension of the Rand. If of these claims 25,000, or 30 per cent. (according to Mr. Kotze's estimate), prove payable, and each payable claim contains 20,000 tons (which may be taken as a conservative assumption), there would be 500,000,000 payable tons of ore under the control of the Government. If the profits accruing to the Government amounted to 2s. 6d. per ton they would represent £62,500,000, or, approximately, half the present total debt of the Union of South Africa." As we pointed out recently, the results of the New Modder, of the Geduld, of Springs Mines, Brakpan, and Daggafontein leave no doubt about the possibilities of the great area held by the State. The question of rendering productive those areas has hitherto only been tinkered with. Areas have been offered to tender one after another, clothed with a multiplicity of conditions and strangled with an impossible profit sliding scale. No capitalist with any sense could be found to entertain a proposition involving the locking up of, say, a round million sterling in sinking two shafts and developing one of the proffered areas up to the point when he would be allowed to share the profits with the State. And if no capitalist could be found to do this before the war, *a fortiori* will none be found to do it in those future days when capital will be more than ever at a premium, caused by war's destruction and the needs of a rehabilitated Europe. A considerable period must elapse, of course, before work on any of those properties can, in the ordinary course of mining, become productive, and, therefore, no more time should be lost than is absolutely necessary. Sooner or later the war will be over, and peace will bring in its train a demand for a widened sphere of employment as well as a broadened basis of taxation. In several recent articles we have dwelt on the necessity for the Government seriously to consider ways and means of encouraging capital to become interested in the Farther East Rand. Mr. Schumacher recently advocated a scheme whereby small investors would provide funds for the development of at least some of the more promising areas. We believe that at present a scheme in under consideration in the Cabinet and high official circles for a renewal of effort to attract capital and interest in the Government leases. We believe that the Government considers a total taxation amounting to about 30 per cent. of the gross profits by no means unreasonable for ground so favourably situated as the Government Areas on Modderfontein. This means a 20 per cent. taxation over and above the ordinary 10 per cent. profits tax, and we believe that the view adopted by the Government experts is that a reduction of profit by a further 20 per cent. constitutes no unreasonable demand for cession of mining rights over areas known to contain at a workable depth the auriferous conglomerates of the Main Reef series. Of course, on the other side, the locking up of hundreds of thousands of pounds in each lease for a number of years and the uncertainties inevitably attending mining are brought forward as formidable obstacles to any scheme of exploitation in which the terms offered are not most liberal. It is to be regretted that no official map or plan showing the situation of these various State-owned mining leases has been published. This is in large measure due to the fact that in so far as proclaimed farms are concerned, mynpachts have not yet in one or two instances been demarcated, whilst in regard to unproclaimed farms an exact definition of the mineable areas, disposal of which is vested in the State, is of course at this juncture impossible. In the absence of any official map or plan, it may, however, be of interest to name the Government mining leases in respect of proclaimed ground. On the Farther East Rand the names and numbers of the proclaimed farms upon which the areas are situated are:—Modderfontein 167: Extent, 2,633 claims, now property of Government Gold Mining Areas (Modderfontein) Consolidated, Ltd. Witpoort 162: 1,180 claims; estimated capital required, £720,000. Brakpan 166 and Schapenrust: 2,235 claims; estimated capital required, £1,700,000. Geduld 174. Klipfontein 172. Welgedacht 177. In addition to these there is an important area of between 800 and 900 claims on the farms Mooifontein and Vierfontein in the Central Rand section. This area, of which the State owns the rights of disposal, lies immediately to the south of the Consolidated Langlaagte Company's property. The reef is estimated to lie in the northern portion of Mooifontein at the moderate depth of 3,500 feet, and it is strange that the deeper (in so far as Brakpan-Schapenrust is concerned) Farther East Rand areas on Brakpan, Schapenrust and Witpoort should have been offered before this Central Rand block, with its decidedly more attractive possibilities. At any rate, we look to the Government in the near future for evidence of the active forward policy foreshadowed by General Smuts last year, and rendered all the more desirable by the events that have since supervened.

A POSSIBLE FAR EAST RAND AMALGAMATION.

Favourable Position of Rand Klip and Cloverfield Properties.

The Cloverfield property has long been spoken of as a "likely" factor in a big Far East Rand merger, and lately its name has been connected with Rand Klip. Nothing definite or official, however, is known regarding the project, but its advantages are plain enough. A word about both properties may, therefore, at this juncture be interesting. The Rand Klip Company was registered in the Transvaal in 1894, under the title of the Amatola Estate and Gold Mining Co., Ltd. In May, 1895, a reconstruction was effected under the title of Klipfontein Estate and Gold Mining Co., Ltd. In June, 1909, the undertaking of the Rand Klipfontein Co., Ltd., was acquired for 127,280 fully-paid shares, and the name changed to present title. The property now consists of the entire unproclaimed farm Klipfontein No. 22, containing 3,451 morgen, adjoining the properties of the Modderfontein B, Cloverfield and Welgedacht Companies in the Boksburg district, Eastern Witwatersrand, Transvaal. Two five-compartment shafts have been sunk to depths of 1,854 ft. and 555 ft. respectively. The reef was cut in the east shaft at 1,792 ft. in June, 1912, dip eight degrees, width 54 inches, value 2·1 dwts. Development work was in progress to March, 1913, when, owing to failure to disclose any workable quantity of pay ore and also to exhaustion of working capital, it was decided to suspend operations. The authorised capital is £475,000, in 475,000 shares of £1 each; 432,336 shares are issued and fully paid. The capital was increased from £200,000 to £235,000 in July, 1899, the 35,000 new shares and 25,000 shares then in reserve being offered to shareholders at par, but only 968 were taken up. In February, 1903, 24,032 shares were disposed of at 45s. per share. In June, 1909, the capital was reorganised by cancelling 111,112 shares, thereby reducing the capital to £88,888, shareholders receiving four new shares for every nine shares held, fractions being paid off at the rate of 25s. per new share. The capital was then increased to £475,000 and 127,280 allotted to acquire the Rand Klipfontein undertaking; shareholders in both companies were then invited to subscribe for 216,168 shares at 25s. each, being share for share. The issue was guaranteed by the Anglo-French Exploration Co., Ltd., and others in consideration of an option until February 28th, 1911, over 108,084 shares at 30s. each. This was not exercised.

CLOVERFIELD PROSPECTS.

The Cloverfield property is situated to the north of the Geduld Proprietary, is adjoined on the west by the Modderfontein B., on the east by Welgedacht, and the north by the Rand Klip. A scheme of amalgamation in which the Cloverfield, Welgedacht and Geygerle Companies would participate was mooted some time ago, but nothing has been heard of it recently. The capital of the concern is £385,000 and 30,000 shares are held in reserve. At the end of 1912 the loan had been increased to £46,280 0s. 11d., which included interest to 31st December, 1912. As security for this loan, the lenders as stated in previous annual reports, hold an irrevocable power of attorney to pass a bond over the company's property.

The property consists of 799 claims, comprising the whole of the Cloverfield block, adjoining the farms Geduld and Welgedacht, Far Eastern Rand. In January, 1903, No. 1, or the western of the two boreholes on the Cloverfield area, intersected the pay portion of the Van Ryn Reef at 1,979 feet depth from surface, showing 17½ inches thickness, of which top 9 inches indicated 10 dwts. and lower 8½ inches 54 dwts., equal to about 16¼ dwts. average over a stoping thickness of 3 feet. The Modderfontein reef formation, thick in aggregate, but unpayable, was passed through nearer to surface. The situation of the bore is due north of No. 3 bore on the Geduld. Bore No. 2 (eastern) in April, 1903, cut the reef series from 2,975 to 2,998 feet, varying from 1½ inches to 8½ inches in width; assays few grains, except footwall leader, of which 6 inches core was lost; remaining 4 inches reef assay 1 oz. 8 grs. per ton; footwall shales at 3,008 feet. Calculated from information obtained from the boreholes, as well as those put down on the neighbouring farms, the dip of the reef varies from 12 to 20 degrees. In the centre of the property the reef is probably flatter than is shown by the above dips. The area at the western boundary, parallel to the line of strike, is 5,000 feet wide, the greatest width being 5,200 feet. It is proposed to work the property with one five compartment shaft, located 1,000 feet east of the west boundary and 1,500 feet north of the south boundary. The shaft (7 feet by 18 feet) intersected the reef on June 15, 1909, at 2,043 feet. Sixteen sections of reef matter all round the shaft indicated by sampling 22·3 dwts. over a width of 10½ inches. The average value of the 5,400 feet of reef sampled during the year 1910 was 16·6 dwts. over a reef width of 11½ inches, and the consulting engineer pointed out that this result in itself could not be considered very satisfactory; but the details of the work indicate the existence of areas of good value. In fact, the average of a total of 2,705 feet of reef exposed from the 1st level drives was 11·7 dwts. over 14·4 inches, whilst the average for the 1,330 feet sampled in the 2nd level drives was 16·7 dwts. over 12·5 inches, which was a decided improvement; and both the north and south faces of this level were stoped in good ore. The consulting engineer's opinion is that the area explored is too small a percentage of the total area of the property to afford definite information for gauging its possibilities.

MINING PROGRESS IN MADAGASCAR.

Drilling for Oil—Other Activities at a Standstill—A Sympathetic Government.

The outbreak of the war in Europe resulted in a cessation of almost all mining activity in Madagascar. Drilling, of course, is being continued by the Sakalava people, with promising results. Gold and graphite mining are, however, at a standstill, most of the Frenchmen on the island having returned to France to rejoin the colours. Mr. Waldie Blaine, who returned recently to the Rand from a six months' visit to the island, speaks highly of the courtesy with which the Colonial Government treated him, and expresses himself favourably impressed by the mineral possibilities of the country. He has taken up a large tract of land, and hopes to turn it to good account when conditions become more favourable. We learn from Mr. Blaine that the mining legislation of the island has again been amended, a new law, dated May 23, 1907, having taken the place of the regulations promulgated in 1905. This measure compares favourably with that which it supersedes, its conditions being similar to those of the Mining Decree of February 20, 1902. Under these new regulations the radius of a circle covered by a prospecting permit (*permis de recherche*) is increased from 1 to 2 kiloms. (1¼ mile). Prospecting permits, the charge for which is £4, are available for one year from their date of issue. This limit may be extended to a second or third year on further payments of £8 and £12 respectively. An *ad valorem* tax of 7 per cent. is also levied on the value of the gold obtained. Within a period of three years prospecting permits must be transferred into *permis d'exploitation*, and claims pegged out in the form of a rectangle not exceeding 1,000 hectares (2,470 acres), nor less than 200 hectares (494 acres). The annual tax on such claims is 7 per cent. of the value of the gold obtained, with a quarterly minimum payment of £6 on alluvial workings and £40 on reefs. The basis for the computation of this 7 per cent. *ad valorem* tax is established at the rate of 2 fr. 80 c. per gramme, or £2 13s. per oz. troy, on gold, and on precious stones at the rate of 10 fr. per kilo., or 3s. 7½d. per lb., for high class stones and 5 c. per kilo for stones of inferior descriptions. It is almost certain that the end of the war will mark the beginning of a new era for Madagascar mining.

COMPARATIVE SAFETY OF ELECTRIC AND FUSE BLASTING.

City Deep Accidents Again Call Attention to Subject—Value of Delay Action Exploders.

It is usually urged in favour of electric blasting that on account of its being controlled from a distance it is safer than detonation by fuse. A recent accident in a Catskill aqueduct tunnel, where electric firing is employed, was reported in the daily press as caused by premature explosion. As a matter of fact, it was not, but the report suggested that possibly there is a danger concealed in this method which is not duly appreciated. It is possible to take great precautions in electric firing, such as making it necessary to close several connections to complete the circuit, and placing the operation in the hands of an experienced man with the apparatus under lock and key. But the danger of accidental closing of the circuit cannot be entirely eliminated, and the system has the disadvantage of setting off the blast instantly and without warning, whereas a spit fuse, like a rattlesnake, gives fair warning of its presence. In connection with this an abstract by *Engineering Record*, February 15, 1913, of a report by O. Dobbelstein, in *Glückauf*, is interesting. Many of the new German regulations, he says, are based on the belief that the system of firing by electricity is safer than that of ignition by the ordinary cord fuse. Electric firing, for example, has been made compulsory since January 1, 1912, in certain classes of mines in the Dortmund district. The belief is founded on statistical evidence given below. These figures deal with the years 1908 to 1911, inclusive, and show the number of fatal injuries in that period to have been 43 with electric firing and 51 with safety fuse, the injuries causing permanent disablement being 44 and 66, and temporary disablement 131 and 146, respectively. These figures, Mr. Dobbelstein contends, being absolute are valueless. In place of them he gives a table, in which the figures are related to the number of men at work in the mines. In those in which electric firing only was permitted, 71,555 men were employed, the number in the mines using the ordinary fuse being 112,698. The proportion per 1,000 is as follows: For fatal injuries 0·111 for electric firing and 0·076 for fuse; for permanently injured 0·101 and 0·105; and for slightly injured 0·328 and 0·220, respectively. Thus these statistics are in favour of the ordinary fuse system. This fact, it is stated, must be attributed to the often imperfect electric fuses and unsuitable firing machines used, and to the ignorance of the miner. It is practically impossible either to misunderstand or to misuse the cord fuse. But in this case also safety depends largely on the quality of the fuse. The relative value of these two systems is said to be becoming a question of the highest practical importance in view of the Government regulations which are now being formulated to cover this subject. Doubtless, as Mr. Dobbelstein states, the accidents with electric firing are largely due to the poor detonators and firing apparatus and to the ignorance of the miners, but even the elimination of these unfavourable conditions would probably only put the method on a parity with fuse firing in point of safety. The choice between the two systems would not seem to be capable of legislative regulation. There are many defects in our state mining laws, and some grave omissions, but the choice of electric or fuse firing is one that may be safely left to the judgment of the operators, for the present, at least. Data of wider derivation and especially data on comparative results in America, may eventually show definite advantages for one system. The collection and analysis of such data is a thing highly to be desired. The following extract from an article on "Electric Blasting in Shafts with Delay Action Exploders," by C. W. Morse, may, in this connection, also be quoted:—

> "Blasting with electricity in shaft sinking is not receiving the attention it deserves. The principal reason seems to be that comparatively few mine superintendents and engineers are familiar with the delay action exploders as perfected by the California Cap Company. The largest powder company in the United States attempted to perfect such an exploder, but was not entirely successful. Shaft sinking is an anxious period with most of us, and anything that will render it less dangerous is surely welcome. The delay-action exploder is something that many of us have hoped for. These exploders were used in sinking the South Jackson shaft, at Jackson, Amador County, California. The superintendent, Jeffrew Schweitzer, reports that they were most satisfactory. Jack Collier tried them later at the Sultana mine, at Grass Valley, with equally good results. The exploders are made up with an electric fuse igniter, a short length of time fuse, and a detonator, all contained in a waterproof covering. They are made in ten periods; the different periods being obtained by varying the lengths of fuse. The longest will go into the regulation stick of powder. They can be obtained with any length of wires. In blasting in a wet shaft, current should be taken from the light circuit, as there are many sources of leakage and the ordinary blasting machine will not supply sufficient current. Two wires are brought from the light circuit to a small box which should contain fuses of lower amperage than those on the light circuit, a knife switch opening down and held open with a weight or spring, and two binding posts; an indicator lamp is convenient. This box should have a lock for which the blaster only has a key, and should be placed near the collar of the shaft or at a convenient station. Near by is a reel for holding and playing out a No. 10 encased cable The inside end of the cable is left protruding sufficiently to permit its being connected to the binding posts when the box is opened. The cable reaches to within a few inches of the bottom of the shaft, and to each of its two wires a length of bare telephone wire is attached and placed horizontally across the shaft, being kept off the bottom with blocks of wood. To these wires the exploders are attached in parallel by the insulated wires with which each is supplied. In loading the holes the first delays are, of course, used in the cut holes. For most work, five periods of delay are all that are required. When the men, including the blaster, reach the surface, the blaster unlocks the box, connects the ends of the cable to the binding posts, and throws the switch. At the South Jackson, they took the additional precaution to have a break in the cable, the ends being held together during the blasting. All miners can recall many horrible accidents that would have been avoided by the use of this method of blasting, and not only are accidents avoided, but the fumes are also done away with, and the air in the shaft is rendered less foul by the round."

Mining in Angola.

Angola, the Portuguese possession on the west coast, which Germany seems anxious to acquire, has the makings of an important mining country. According to an official German publication, the mining industry of Angola is at present only in the first stage of development, but it is believed that the country holds rich mineral deposits. In the Loanda district, near Zenzse, copper, iron, and coal deposits have been discovered by Hans Gründler, a German prospector. They are situated in close proximity to each other, the distance from the railway being no more than from one to sixteen kilometres. The coal area covers 300 hectares, copper 100, and iron 200. A Bremen syndicate has acquired the concession of the three areas, and has already spent M. 400,000 in prospecting and development work, which is stated to have given satisfactory results. Further inland, all round Holungo Alto many indications point to the occurrence of rich ore deposits; large magnetite iron occurrences have already been proved there. Near Bembe prospectors in the service of the Portuguese Government have found copper, but, so far, the authorities have not done anything for the development of the ores; some private companies have not been successful, and the Companhia de Mossamedes has abandoned its claims. The Rassinga district, where gold was expected to occur, has proved a disappointment. The Lobito Railway Company, which has the prospecting rights extending over an area of twelve miles on both sides of the railway, has spent M. 12,000,000 without any results; its rights lapsed in 1914. Rich petroleum fields are believed to exist in Angola. The concession to exploit certain areas has been granted to a Portuguese firm, backed to some extent by British capital. The richest area is said to be on the Daude river. So far, the exploration works are stated to have given satisfactory results.

Luipaardsvlei Estate.

During the month of December, 1914, this company crushed 17,902 tons, the total profit won being £2,276.

PERSISTENCE OF ORE IN DEPTH.

Mr. C. B. Horwood's Contribution to the Discussion of Mr. T. A. Rickard's Paper—Notable Tribute to the Rand.

In discussing Mr. Rickard's paper at the last meeting of the Institute of Mining and Mechanical Engineers, Mr. C. Baring Horwood said there were only one or two points to which he would like to refer that evening. First, in commenting upon the author's very able paper, it seemed to him that perhaps the most striking feature was that there should be any need for such a paper at all. However, he frankly admitted that, unfortunately, the need did exist, and he trusted that the paper would have the effect of calling forth much illuminating discussion. It was true that there were certain classes of deposits in which no deterioration in the value of the mineral contents with depth need necessarily be expected, so long as the deposits themselves persisted and no change occurred in the enclosing rock. As examples of such might be mentioned, amongst others, replacement deposits such as were often represented by galena or hæmatite in limestone; and also those due to magmatic segregation, such as certain magnetite deposits. However, with regard to those having an origin similar to that of lodes, which were he believed those with which the paper really dealt, he thought it was generally admitted that below the zone of secondary enrichment a decrease in value in depth was naturally to be expected. Such decrease in value was due to well known chemical and physical laws which were easily understood and which had been lucidly expounded by various well known authors. In this connection he would like especially to call attention to an able presentation of the subject by Mr. W. H. Weed,* in a discussion on "Secondary Enrichment at Cripple Creek." In that discussion Mr. Weed dealt with the point just now raised by Dr. Cullis, namely, the vertical range in which deposition might, or was likely to, occur, which seemed to him (the speaker) to be the question on which the explanation of the whole matter largely depended. Referring now in detail to some of the points raised in the paper, the author might perhaps be surprised to learn that when the speaker visited Przibram in the early part of 1911, the silver-lead deposits were still being worked at the Adalbert Mine, and at a greater depth than that mentioned by Mr. Rickard. They had, however, become considerably poorer, the galena contained less silver and it was more intermingled with quartzite. He hoped to refer to this again in greater detail at the next meeting. It was with the author's remarks concerning the Rand that he especially wished to deal that evening. He thought it was necessary first of all to point out that, speaking generally, the economic limits of a lode deposit could usually be represented in vertical longitudinal section, or in section along the plane of the lode, by a figure resembling the vertical section of an inverted cone, the base of which corresponded to the profitable portion of the outcrop along the strike. These cone-shaped figures were often somewhat squat, frequently they approached equilateral shapes. They were seldom greatly elongated in comparison with their inverted bases, which meant that the extent of the profitable ore along the dip was seldom more than (or even as much as) the length of the profitable extension along the outcrop. This being so it was clear that some relationship existed, as Mr. McCarthy had just maintained, between the profitable extension of outcrop and the persistence of economic possibilities in depth. Further, the existence of this relationship appeared to him to be easily explainable; cracks or fissures which might perhaps be well defined at the earth's circumference gradually became smaller and smaller, and finally tailed out and vanished as the rocks in depth became more compact.† Thus deep-seated mineralizers gained admission at great depths to fissures through minute cracks of slight lateral extension. As distance was gained towards the surface the fissures became less tight, and in consequence the solutions in ascending spread out fan-shape on either side along the fissures. In the case of the Rand the function of fissures had been performed by big, well-defined bed of conglomerate which had necessarily differed from ordinary fissures, inasmuch as the walls had been kept apart by intervening pebble beds. Curves compiled to show the relationship between the widths of the banket at various levels showed clearly that the widths diminished gradually as depth was attained; that diminution in width doubtless being due to increasing pressure. These beds had thus formed porous channels throughout their entire length down to great depths. Consequently, instead of the lateral boundaries of the economic area tapering down to an apex, the average mineralization, whatever its value, at various horizons in depth should extend, at those respective horizons, the same distance, measured along the strike, as it did at the outcrop; and experience on that goldfield had shown that it did. In other words, the economic limits of this particular ore body would be eventually represented in vertical longitudinal section, not by a figure resembling the section of a cone, but by a rectangular figure having, needless to say, its longer axis parallel to the strike of the beds. The author had alluded to the fact that the two deepest mines on the Rand were closed, but the conclusion suggested seemed quite unwarranted. It was true that those two mines were temporarily closed, but the author omitted to state that they were situated in what were admittedly poor areas of the Rand; and he also omitted to mention that in certain poor areas there were outcrop mines also which, although not worked out, had been closed. The vertical depth of the deepest workings on the Rand was less than one-fiftieth of the length of the profitable extension of the outcrop along the strike. The Village Deep, to which the author also referred, was being worked at an inclined depth of some 7,500 feet, and it was obvious that the economic limit of depth had not yet been nearly reached. The outcrop, or sub-outcrop, of the Main Reef series was known for a total distance of some eighty miles. Fram Randfontein to the eastern boundary of Modderfontein, a distance of fifty-five miles, with the exception of two breaks in faulted and disturbed ground (one on the West Rand extending a distance of about two and a half miles from the Princess Estate mine to the French Rand mine; and the other on the East Rand extending between the New Blue Sky and Apex mines, a distance of three to four miles), there was one continuous chain of mines which with few exceptions were being profitably worked; and it was a significant fact that the mines at both the eastern and western limits of that distance were good. There is no other known goldfield where the outcrop of the lode had been traced for such a long way and had proved profitable over such a great length. It should be remembered that those mines for the most part, worked two separate parallel lodes. What was regarded on the Rand as a single mine generally consisted of two mines situated side by side along the dip and separated by some 60 feet to 200 feet of country, and connected with each other by crosscuts. The unrivalled magnitude of this goldfield could be better imagined if one tried to picture to oneself that strip of fifty miles of twin mines pulled out tandem fashion into one long line of single mines extending over a distance of approximately 100 miles, and then realized that those outcrop, or sub-outcrop,‡ mines were succeeded on the dip by a series of neighbouring and parallel deep-level mines. The agencies which had brought about such an unusually extensive gold deposition, from which already in twenty-seven years more than £400,000,000 worth of gold had been recovered, must have had a vast store of precious metal upon which to draw, and all the available evidence indicated that the amount of gold still to be profitably extracted was very considerably more than had been won up to the present time. In his paper Mr. Rickard admitted that the working costs on deep-level mines were often less than in the shallower outcrop ones as the result of experience, greater efficiency, less water, and the handling of larger quantities of ore. Now each year, in spite of increasing depth, the Rand was developing more and more into an enormous, well-managed, low-grade goldfield, which, with increasing efficiency, larger tonnages milled, steadily decreasing costs and simultaneous lengthening of life by the inclusion of still lower-grade ore within the pay limit, continued to yield enormous annual outputs of gold. To sum up: on the Rand the economic limit in depth had not been reached; and there was no doubt about the greatness of the field as a gold producer for many years to come.

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*Engineering and Mining Journal (1903), p. 553.

†The results of research work indicate that openings cannot exist at a greater depth than about 30,000 feet, and under certain conditions at a much less depth. *Vide* "Ore Deposition and Vein Enrichment by Ascending Hot Waters," by W. H. Weed. *Trans. Am. Inst. Min. Eng.*, Vol. xxxiii. (1903), p. 750. Also "On the Limiting Strength of Rocks under Conditions of Stress Existing in the Earth's Interior," by Frank D. Adams. *Jour. Geol.*, Vol. xx., No. 2. And "Some Principles Controlling the Deposition of Ores," by C. R. van Hise in "The Genesis of Ore Deposits," 2nd Ed. (1902), pp. 286-288.

‡They may be termed "sub-outcrop" mines when the outcrop is hidden owing to the Witwatersrand system being covered, as in places on the Far East Rand, by newer formations such as those of the Black Reef, Dolomite and Karroo.

Middelburg Steam Coal.

Despite a set-back in its output owing to labour troubles, the Middelburg Steam Coal and Coke Co., Ltd., earned only about £500 less profit, namely, £19,265, in the year ended June last than in 1912-1913. However, only one dividend of 9d. per share has so far been paid on the ordinary capital for 1913-1914, against two of that amount each for the previous year, but the directors seem to suggest that they might be willing to make a further distribution if the shareholders at the annual general meeting express the opinion that it would be discreet to do so. The lion in the path is the fact that it has been necessary to write off £15,000 in respect of the share investment in and loans to the Transvaal Gold Trust (which is about to be reconstructed), "together with such further provision as the auditor shall recommend from the reserve fund," now standing at £12,500. The new partly-paid shares received in connection with the Transvaal Gold Trust reconstruction are to be offered to Middelburg holders, and assuming that the latter do not press for any further cash dividend, there will be £8,121 to be carried forward, against £16,671 brought in.

VAN RYN GOLD MINES ESTATE.

Effect of Labour Troubles on Operations—Ore Reserves Satisfactory.

THE nineteenth ordinary general meeting of the Van Ryn Gold Mines Estate, Ltd., was held in London in mail week, Mr. F. A. Gillam (chairman of the company) presiding.

The Chairman said: Ladies and gentlemen, the report and accounts we have the pleasure to submit to you to-day (which I presume you will take as read) constitute a record of your company's operations for the financial year ended June 30 last, which, I am sure you will agree with me, is a satisfactory one. There has been, as you will note, a decrease as compared with the previous year of 16,290 tons in the tonnage crushed and a decrease of £47,660 in the value of the gold recovered. This falling off is due entirely to the labour troubles that occurred on the Rand in June-July, 1913, and again in January last. In my remarks to you last year I alluded briefly to the strike that occurred in July, 1913, and I thought then that the year would be a normal one so far as we were concerned, and that we should probably make up any decrease that had been brought about by that strike. Unfortunately, the labour trouble again broke out in January, and, though the effect has not been very serious, the dislocation of regular work which resulted has been reflected to some extent in our returns. The effect on our work was due not so much to the suspension of milling operations as to the general disorganisation of labour that resulted, and to the consequent diminution in the supply. The native is rather a nervous individual, and if he scents trouble in the areas in which he is accustomed to work he does not come forward. For this reason we have had considerable difficulty in securing an adequate supply. I hope, however, that with relations between masters and men satisfactorily settled, as they appear to be, we may look for a greater increase in the number of natives seeking work on the fields.

CAPITAL EXPENDITURE AND ORE RESERVES.

Capital expenditure for the year, as you will see, has been on a very small scale and, according to our usual practice, we have written off the whole of it, amounting to £3,199 2s. 1d. I may say that so far as I can see there is no likelihood of any material increase under this head during the current year. As regards our ore reserves the position may be described as satisfactory. Although during certain periods in the year under review we had to curtail development work considerably, owing to the necessity of economising our labour for the work of gold production, I am happy to be able to point out that the tonnage fully developed shows a comparatively small decrease in amount as compared with a year ago. It stands to-day at 1,973,312 tons, and, with such large reserves available of payable ore, I think we can be quite easy in our minds about the future. All of this ore is paid for out of past profits. In the matter of water supply, the droughts that have occurred in the Transvaal during the past two years have given us and the managing director some cause for anxiety, and, although Sir George Albu had wisely taken every precaution to obtain from outside sources a supplementary supply, he decided some time ago, in order to render us as independent as possible of such extraneous sources, to take steps to find water on our own property. The boring operations which have been undertaken to this end have, I am pleased to say, been successful in securing a large additional supply, and Sir George Albu proposes to continue to exploit the possibilities of this source still further, and thus, it is hoped, place the company in a position to meet its own requirements in this respect. The general development of the property, while it has necessarily been curtailed, owing to causes to which I have alluded, has not, on the whole, been unsatisfactory, and, while nothing sensational has been discovered, the exploration work done has shown encouraging features. That, gentlemen, completes the remarks I have to make on the affairs of our company for the financial year ended June 30 last.

A NEW SAFETY DETONATING FUSE.

[BY HARRISON SOUDER.*]

THE object of this paper is to bring to the notice of engineers a safety detonating fuse by the use of which misfires in blasting may be eliminated and safety in blasting operations promoted. This new detonator is a French invention, and is known as *Cordeau detonant*, or detonating fuse, and is sold under the name of Cordeau-Bickford. It consists of a lead tube 5 to 6 mm. in diameter, filled with trinitrotoluene. While applicable to all classes of mining, it will appeal especially to those who have to do with deep hole blasting in open cut mines or quarries, or any operations where a large number of holes are to be shot at one time. Since the introduction of the deep hole blasting in the Cornwall iron mines, much trouble has been experienced from misfires, and many experiments were made to determine the best and safest method of blasting. Before the introduction of the detonating fuse it was found that to insure the best results, two or more high-power electric exploders, not less than No. 6, with specially insulated conductors, should be placed in each hole; the holes wired in parallel, and for a large number of holes the current to be supplied by a live wire to the bus or lead wires at about the middle of the bench. The voltage in general use is 110 to 220, but as our material is a magnetic iron ore and the holes are generally damp, we found it advisable to reduce this to about 30 volts to prevent short circuits. A No. 7 or No. 8 special insulated detonator was adopted. But with the best of care and attention to the minutest detail, we were not able to eliminate occasional misfires and the consequent ever-present danger of accidents. In January, 1914, our attention was called to "Cordeau-Bickford," and we were invited to witness a trial blast with this material at the quarries of the Atlas Portland Cement Co. at Northampton, Pa. This was the first use of this detonating fuse in this country, and as it marked a great advance in safety and economy in quarrying operations a brief description of this blast will be of interest. The rock blasted was a cement limestone shale bench 94 feet high (perpendicular), with the bottom well cleaned up. There were eleven 5-inch diameter holes, 26 feet back from the face of the bench and spaced 13 feet apart, 100 feet deep, and extending 6 feet below the bottom of the bench. The holes were cleared of water just before loading. The charge was made up of 50 per cent. gelatin and 40 per cent. low freezing dynamite, with the detonating fuse, 6 mm. in diameter, running to the bottom of each hole. All the holes were connected with a line of detonating fuse to the end of which a single No. 6 detonating cap was attached. This was fired by a 220-volt current from a live wire. Instantly there was a sharp crack as the fuse exploded, followed by a rumble of the crumbling rock. The rock was thrown well out, leaving a clean wall or face. The results of the blast were so satisfactory that we immediately ordered 1,000 m. of the detonating fuse for trial in blasting down our ore benches. This was the first application of this fuse to ore mining. A trial convinced us of the wonderful adaptability of the detonating fuse for the purpose, and the simplicity and safety in handling brought a sense of relief and satisfaction. We therefore immediately adopted it for use in all our deep hole blasting and stopped the use of the ordinary electric fuse except in shallow holes. We have been using the detonating fuse for five months, and in this time we have made a dozen big blasts.

The danger arising from the old method of blasting with electric exploders is exemplified by the only two extensive list of accidents due to premature explosions, misfires, etc. Such an accident as occurred during the construction of the Panama Canal in December, 1908, when 22 tons of dynamite exploded prematurely, killing 23 persons and injuring 40 others, would have been practically impossible if this fuse had been used. In addition to greatly increasing the safety of blasting, the detonating fuse has the additional merit of increasing the efficiency of the explosive charge. To summarise, we may state that this fuse has three very important qualities, viz.: (1) It is safe. (2) It is instantaneous. (3) It increases the efficiency of an explosive charge. 1. *Safety.*—There is no danger in the handling or storage of the fuse. It cannot be exploded by friction, fire, or ordinary shock. It requires the use of a strong blasting cap properly attached to explode it. In blasting charged holes, the cap or exploder can be applied outside the hole, thus avoiding the danger of burned powder caused by side spit from ordinary fuse; also any risk of accident while tamping and the risk from a portion of an unexploded charge accompanied by a cap remaining in the debris from a blast is entirely obviated. 2. *Speed.*—The average rate of speed of this fuse is estimated to be close to 17,000 feet per second, so that when it is used the explosive charge is detonated instantly throughout its entire length, instead of at one point, as is the case with the blasting cap or electric exploder. 3. *Efficiency.*—It is known that the speed of explosive decreases as the explosive wave travels away from the detonator. That the powder in a hole has the strongest explosive effect around the exploder is evident from an examination of the face of the bank after a shot. This can be demonstrated also by placing sticks of dynamite on the ground end for end, about six inches apart, with the cap in the first stick. The explosive force gradually lessens until it finally ceases to progress, leaving the farthest sticks unexploded. By using this fuse the charge is detonated instantaneously throughout its entire length. This results in a saving of about 10 per cent. of explosives as determined by results obtained at Cornwall and elsewhere. It is not affected by heat, cold or moisture, and lasts indefinitely without deterioration. It is wound in continuous lengths on spools containing 100, 200, or 300 feet each, and weighs about 7 lbs. per 100 feet. It is accepted by transportation companies without restrictions, except that it shall not be packed with other high explosives.

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* Cornwall, Pa. Transactions of the American Institute of Mining Engineers, Pittsburgh Meeting, October, 1914.

ECONOMIC GEOLOGY OF THE BELGIAN CONGO.—III.

[BY SYDNEY H. BALL AND MILLARD K. SHALER.]*

COPPER.

Copper ores occur widely in the Paleozoic and pre-Cambrian rocks of the Belgian Congo. Oft the deposits, by far the most important are those of the Katanga copper belt. The mining and smelting of copper ores has for centuries been an industry of the natives living in and near the Katanga copper field, and probably from the presence of stone implements of a still earlier race and the majority of the deposits of the Union Miniére du Haut Katanga (more familiarly known in England and America as the property of the Tanganyika Concessions Company, Ltd., which, however, has about a 42 per cent. interest in the holdings of the above-named company) are black men's mines which have been relocated by whites. At present three mines the Star of the Congo, Kambove, and Luushia—are being exploited. The Katanga copper deposits are situated in south-eastern Belgian Congo, about 11 deg. S. of the equator, and not far north of the Rhodesian frontier. Up to date about 160 deposits are known, within a belt extending 90 miles east from the Lufupa River, thence bending suddenly E.S.E. and reaching a point 110 miles distant. The cupriferous belt is from 30 to 60 miles wide. The Portuguese half castes P. J. Baptista and Amaro José, who crossed Africa from Angola to Tete on the Zambesia in 1802, first mentioned this cupriferous region. Their description follows: "When we started from this farm of Chamuginga Mussenda (situated approximately 25 deg. 10 min. E. and 11 deg. S. S. H. B.-M. K. S.), we travelled across others with valleys and hills, and saw, on the summit of the hills, stones which appear true (green?), and where they dig the copper; in the midst of this country is where they make the bars." Livingstone, Burton, Cameron, Joseph Thompson and Wissman all heard from the natives that rich copper mines existed in the Katanga. Reichard in 1884 was, however, the first white man to see them in the nineteenth century, and he was soon followed by Capello and Ivens, Portuguese travellers, and later by the Scotch missionary Arnot. It was, however, Professor Cornet who, in 1892, returned to Europe with the first satisfactory report upon these deposits. The Katanga copper deposits are situated on a plateau whose surface has been cut by erosion into numberless rounded hills and rather steep-sided valleys. The geological structure indicates that the country in some time past was mountainous; was later, as Cornet holds, peneplained and still later eroded into its present rugged form; erosion has hence been rather deep. Elevations of the higher hills and the lower valleys are respectively 5,200 and 3,900 feet above sea-level. The copper-bearing strata are harder as a rule than the associated rocks and, in consequence, the ore deposits usually form cones or rides. One or two of the deposits, notably Luushia, however, occur below low-lying land. The mineralized hills, in contradistinction to the surrounding timbered country, are bare, and between them and the forest grows the misuku or mahobohobo bush (a wild species of loquat), which is here a most excellent indicator of copper. This deforestation, due possibly to the presence of soluble copper salts in the soil and subsoil, has been a valuable aid in prospecting, as has the topographic relief of the deposits. C. Guillemain, however, believes that the lack of trees is due rather to the soilless rocky outcrop of the hard beds of copper-bearing rocks, and states that all treeless areas are not cupriferous. He found, however, an azure blue flower to be confined to places at which copper occurs, growing only on outcrops, slag dumps, or piles of ore. Such bareness, however, has been noted by us in other copper regions, and probably is in part due to the presence of cupriferous solutions in the soil. Studt finds the rocks of this portion of the Katanga to consist, in addition to various igneous rocks, of a series of sedimentary rocks, largely quartzose. From lithologic resemblance to those of Rhodesia and South Africa, he believes them to range in age from pre-Cambrian to Permo-Carboniferous. The oldest rocks, the Kafubu beds (supposed to be the equivalent of Rhodesian Swazi schists and probably at least of Cambrian age), consist of compact granular quartzites, usually white or pale red in colour. Near granite intrusions, they pass to quartz and mica schists. Upon this lies unconformably the Wemashi beds consisting of dark coloured conglomerates, greywackes and shales. These rocks are taken to be the equivalent of the Black Reef series of the Transvaal system and are hence of middle Silurian age. Passing gradationally upward from the last are the Kambove beds, consisting of grey dolomites, sandstones and shales more or less pyritic. The bedding planes of these rocks have been obliterated at most places by the development of cleavage. The dolomites, which owe their colour to carbonaceous matter, contain much chert. These beds also are supposed to be equivalent to the Black Reef series. On these conformably lie the Lufira beds, consisting of fine-grained brick-red sandstone and shale with interlaminated brownish sandstone and red and white banded shales and a few thin beds of red dolomite. This series is supposed to be equivalent to the Pretoria series of Transvaal and is hence of Devono-Silurian age. Studt states that the Kundelungu sandstones lie on these rocks without stratigraphic break and are equivalent to the upper part of the Pretoria series or are of Devono-Silurian age. This, however, is directly contrary to his former conclusions and to those of Cornet, that these beds are equivalent of the Karroo sandstone and hence are of Permian age. He further believes that the Lubilasche sandstone beds of Katanga, which lie unconformably on the Kundelungu, are the equivalent of the Waterberg system (hence Devono-Carboniferous), and that these are overlaid unconformably by the Lualaba coal bearing shales, which later he correlates with the Ecca beds of the Karroo. Other students of Katanga geology, however, regard the Lualaba as older than the Lubilasche and of Jura-Triassic age. Certainly, this is the relation of lithologically similar rocks in other portions of the Colony, with the geology of which the authors are more familiar. In an earlier work in which the correlations were respectively Wemashi, Upper Silurian; Kambove, Upper Devonian; Lufira, Lower Carboniferous; and Kundelungu, Permian, Studt is in accord with other students of the region, but due to his many years of field work as geologist for the Tanganyika Concessions Company, his more recent conclusions should be accepted, particularly in regard to his correlation of the older rocks. Xhignesse and Mercenier have recently done careful work in the Lukuga coal basin, and find the Kundelungu beds to lie conformably upon the coal-bearing measures which enclose Permo-Carboniferous plant remains. In consequence, for the present at least, we must consider the Kundelungu as of Permian and the Lubilasche as of Jura-Triassic age. Most of the copper deposits occur in the Kambove and Lufira rocks; some, however, in the Wemashi beds. The copper-bearing strata consist of sericite schists and quartzose rocks, varying from soft shaly sandstone to pure quartzite, and in instances include also slate, dolomite, and a cellular quartzose rock. These rocks are usually of light colour near the ore deposits, because of bleaching. The interbedded reddish sedimentary rocks are barren. Cornet states that these rocks in Middle Carboniferous time were compressed into two systems of contemporaneous folds, junctioning near the Ruwe gold mine. The axes of one set in the Lualaba region extend from N.E. to S.W. and those of the second in the central and southern portions of the Katanga, course from W.N.W. to E.S.E. Studt, on the other hand, believes that the former were developed in pre-Silurian time and the latter in mid-Devonian time. The predominent dip of the W.N.W. E.S.E. folds is to the north. The majority of the copper mines are strung along like beads on chains in lines parallel to the latter folds. The ore deposits are characteristically associated with sharp folding, faulting, brecciation, and an unusual degree of metamorphism. The ore bodies vary in size from comparatively small to large ones, the largest of which, Kambove No. 2, is reported to be 3,000 feet long and so far as tested from 240 to 400 feet wide. The ore as a rule impregnates a sedimentary bed or several beds rather sharply defined from the barren country rock. In several cases ore bodies occur in well defined anticlines, and in one case presumably in a syncline. The deposits are tabular lenses, and in the greater number of cases the ore body follows the dip of the country rock. The ore within each sandstone bed is discontinuous, but in the same bed several lenses may replace each other along the strike. Studt notes the fact that ore in instances may occur on but one side of an anticline or syncline. In instances, according to Stutzer, the ore cuts across bedding planes and follows secondary structures such as schistosity. Studt regards the quartzose cellular rocks as a silified dolomite altered by the mineralizing solutions which deposited the copper ores. The ore beds parallel this breccia, which is frequently in the centre of the deposit, and cross the bedding planes at high angles. In the Kansanshi mine, a presumably similar deposit, across the Rhodesian frontier, the copper ore occurs in vertical fissures at right angles to the stratification. The ore usually preserves its width in the upper silicious beds, but splits into stringers in the underlying dolomite, which contains disseminated chalcopyrite grains. At the Star of the Congo mine, Studt states that the ore in depth is parallel to the cleavage rather than the bedding planes, and that the superficial oxidized ore is replaced in depth by pyritiferous dolomite. The quartzose cellular rock, which is much fissured, contains large masses of copper carbonates and oxides. Away from this quartzose band the country rock is impregnated more or less completely with malachite, chrysocolla and azurite. In schists, thin sheets of these minerals occupy the closely spaced schistosity planes in such a way as to remind one, looking across the schistosity, of a book whose leaves are alternately green and white. In the sandstones, the plates of malachite are less closely spaced. Finely divided chrysocolla, azurite and malachite also impregnate the various mineralized rocks, and the three minerals, frequently closely interbanded, occur in botryoidal and mammillary masses filling joint and breccia fractures. Atherton states that the amount of copper ore present varies directly with the porosity of the containing ore. Sandstones, once porous, are completely filled by copper ores, but massive flagstones are barren except for ore in fractures. The most abundant copper minerals are malachite and chrysocolla; azurite, copper pitch ore, and melaconite are less abundant. Cuprite, dioptase, native copper, linnite, libethenite, olivenite, and cyanotrichite are rare, as is also a blue crystallized phosphate of copper and cobalt, presumably a new mineral found at the Star of the Congo mines. Buttgenbach reports the presence of two generations of malachite: an older, contemporaneous with the original gangues of the ore, and a younger, deposited in cavities from the solution of the other. Studt states that cuprite alters to melaconite and then to malachite. Sulphides are characteristically absent, in native pits at Luushia 6 to 12 feet deep, however, chalcopyrite occurs in shale with malachite, psilomelane and limonite. The chalcopyrite alters to malachite and limonite, and in consequence some of the malachite at least was derived from the alteration of sulphides. Chalcopyrite has also been found in veinlets at Kambove and, at the Musonia mine, impregnates sandstone. Both chalcopyrite and pyrite in small quantities were encountered in drill holes at the Star of the Congo mine at a depth of 60 meters.

(To be continued.)

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*Published by permission of the Societie Internationale Forestiere et Miniere du Congo in "Economic Geology."

MORE "SAFETY FIRST" LESSONS FOR THE RAND.—II.

Details of the Safety Movement in the Lake Superior Iron Region.

[BY EDWIN HIGGINS, PITTSBURG, PA.]*

WELFARE AND EDUCATIONAL WORK.

It has long been recognized that various measures looking to the welfare of workmen are most desirable from many standpoints. In the study of safety work it has developed that any line of work that will serve to secure the co-operation and confidence of employees is of the greatest value in promoting safety. Without the co-operation of the workmen safety work cannot advance, and in order to gain this co-operation it is necessary first to secure the confidence of the men. Indeed, many students of safety believe that the winning of this confidence and co-operation constitutes almost the entire safety problem. Lake Superior mining companies are spending as much, if not more, money in welfare and educational work than on the actual installation of safety devices. Among the activities of several of the large companies looking to the welfare of the miner may be mentioned the following: The provision of a pension fund for workmen who have grown old in the service of the company; erection of club houses where the workmen may spend their idle hours; the building of model towns and houses for the use of workmen; the offering of cash prizes for the best kept premises, lawns, and flower gardens; the building of expensive and commodious dry or change houses. Practically every iron mine in the Lake Superior region is provided with a dry or change house; some of these are models of cleanliness and perfection in other details. Among the more important educational features designed to secure the co-operation of the miner, may be mentioned the following:

Rules and Regulations.—Practically all of the large companies issue to their workmen books of rules and regulations. In some cases these books are printed in from eight to ten different languages. In general, they cover all departments of mine work. These rule books in the past have contained many regulations that were not enforced, but of recent years there has been a noticeable tightening in this respect and the tendency now is to eliminate many of the useless rules and to be more strict in the enforcement of those retained. There is still room for improvement, however, in the matter of enforcing rules.

Cash Bonuses.—The matter of cash bonuses to bosses and others for the prevention of accidents has not, in the past, been given serious consideration. During the last year, however, the management of several companies have come to the belief that an equitable system of cash bonuses will be of value in reducing accidents. There is only one company that has really put the system into operation. While the method used by this company cannot be termed strictly a bonus system, it is in principle the same thing. By paying to shift bosses salaries that were larger than those paid by other operators, but insisting that these shift bosses be safety enthusiasts, this company has conducted its operations with a minimum percentage of accidents for the district. One large company is preparing to adopt a system of paying large cash prizes to the shift bosses turning in the best records as to the number of men killed or injured while working under their supervision.

Publicity of Accident Records.—A method of attracting the attention of the workmen to the hazards of their employment, which has been adopted to a certain extent, is to post placards at various points in and about the mine calling attention to all serious accidents that happen, and pointing out how they might have been prevented. In some cases sketches and photographs are used as illustrations with these placards. At some mines the records of the different shift bosses, as to the number of accidents that happen to the men working under them, are posted in conspicuous places.

Pay for Safety Suggestions.—It is the general practice in the district to offer cash rewards for suggestions from workmen that may lead to safer working conditions.

First-Aid and Rescue Instruction.—Through the activities of the mining companies, in co-operation with the Bureau of Mines, miners have been trained in first-aid and rescue work at practically every mine in the district. This work has not been limited to three or four men at a mine, but in many cases has been continued so that in some cases as many as 20 per cent. of the employees have received first aid training. Training in rescue work, however, has usually been limited to from five to ten men at a mine, or group of small mines

WORK OF COUNTY MINE INSPECTORS.

The various counties of the Lake Superior district in which mines are situated are each provided with a mine inspector. In some cases this inspector is allowed to employ such assistants as may be necessary in his work. The various counties require that every mine shall be inspected at stated periods. The principal duty of the county mine inspector is to see that the mines are operated in accordance with the laws of the State. He is empowered with authority to cause the closing down of a mine in case the management refuses to comply with his demands. In reality, these inspectors have rendered services in excess of what is demanded of them by law. Through the study of conditions in the mines they gain information that is of common value; such information is disseminated to mine operators in the form of suggestions for the promotion of safety. One inspector has gone so far as to make and keep records of safety devices and methods. These he has communicated to all the operators in his county through the medium of circular letters and blueprints. The efforts of these county mine inspectors and their assistants have gone far toward promoting safety in the mines of the Lake Superior region.

WORK OF THE CO-OPERATIVE RANGE COMMITTEES.

There have been organized on the various iron ranges what may be termed co-operative range committees. During the year 1913, five such organizations were perfected. It is believed, however, that only three of them are now holding regular meetings and doing efficient work. These committees are made up of mine superintendents, mine captains, shift bosses, safety inspectors, men in charge of first-aid and rescue work, and other mine employees interested in safety work. The committees have the backing of the management of the mines, which stand the bulk of the expense of carrying on their work. The organizations are made up of representatives of practically all companies within a given radius. For instance, the Gogebic Range Mining Association includes in its membership representatives from all companies operating on the Gogebic range. The purposes of this organization, as set forth in its by-laws, are to promote social intercourse and the interchange of ideas on all subjects of mining interest, for the mutual benefit of its members; and to perpetuate efficiency, welfare, safety, mine rescue work and first-aid to the injured in and about the mines. These purposes are accomplished by (a) social meetings; (b) remarks, discussions, and the presentation of papers by members of the organization at different times; (c) occasional visits to the different mines, plants and properties upon invitation of the management of same; and (d) occasional competitive meets for crews trained in mine-rescue work and first-aid to the injured. The greatest good done by these committees has been in disseminating, for the benefit of all the mining companies, information relating to safety, efficiency and other mine work. They have developed in some cases into organizations representing the needs and wishes of entire communities. Their opportunity for the promotion of the general welfare is unlimited.

WORK OF THE LAKE SUPERIOR MINING INSTITUTE.

The Lake Superior Mining Institute some years ago established a committee on practices for the prevention of accidents. This committee holds special and stated meetings at which are considered important problems relating to safety and mine operation. Among important subjects upon which recommendations have been made may be mentioned the uniformity of mine-accident reports. Under present conditions the mining companies make reports of accidents to several different organizations, all of which require different classifications of accidents. The work thus entailed is enormous. By providing a uniform type of report this undue work may be eliminated. Furthermore, reports of the county mine inspectors, although satisfactory as far as the needs of each county are concerned, are made in such form that it is impossible to make intelligent comparisons of records of the various counties. An effort will be made, through this committee, to standardize all reports. In addition to other important considerations, a study is now being made of mine rules and regulations, with a view to eliminating unnecessary regulations and including others that appear to be of paramount importance. This committee recently considered and made recommendations that led to the holding of a first-aid contest at Ishpeming, Mich., during August, 1914. This meet was attended by teams from all over the Lake Superior region.

WORK OF THE FEDERAL BUREAU OF MINES.

The Federal Bureau of Mines has headquarters at Ironwood, Mich., established in November, 1912. It has recently acquired, through lease, a small tract of ground on the right of way of the Chicago and North-Western Railway, and a spur has been built thereon for the accommodation of the rescue car. Arrangements have been practically perfected under which the operators of the Gogebic range will erect a building containing the necessary office room and housing for the rescue car. The Bureau's representatives in the district have comprised a district engineer, a foreman miner, and a first-aid miner. The rescue car has been active in training the miners of the entire region in first-aid to the injured and rescue work. It has not, however, been continuously engaged in this work owing to lack of available funds. Up to the present time there have been trained in the entire district a total of approximately 700 men in first aid to the injured, and 400 men in the use of oxygen breathing apparatus. These men have trained others, and it is estimated that there is now a total of 2,000 men in the district who have received training in first aid to the injured, and 1,000 men who have received training in the use of oxygen breathing apparatus. In addition to this work of training, the district engineer has visited and examined a large proportion of the mines of the region. These examinations were followed in some cases, at the request of the management, by recommendations for increasing safety in the mines. Special investigations undertaken include those having to do with ventilation, mine fires, organization and conduct of safety work, the use of mine sign boards, and hoisting signals. Papers have been written on these subjects for publication by the Bureau and by various mining institutes. Other educational work carried on comprised illustrated lectures to the miners in and about the mines visited by the rescue car. The district engineer brought about the organization by the co-operative range committees mentioned above.

(To be continued.)

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* Paper read before A.I.M.E.

TRANSVAAL GOLD OUTPUT FOR 1914, £35,588,075.

Satisfactory Returns for Year of Many Setbacks—December Figures Show Decrease.

THE official output returns for 1914 are as follows:—

1914 Total (Transvaal)	£35,588,075
1913 Total (Transvaal)	£37,358,040
Decrease	£1,769,965
1914 Yield	8,378,139 ozs.
1913 Yield	8,794,824 ozs.
Decrease	416,685 ozs.
Witwatersrand, 1914	£34,124,434
Witwatersrand, 1913	£35,812,605
Decrease	£1,688,171
Outside Districts, 1914	£1,463,641
Outside Districts, 1913	£1,545,435
Decrease	£81,782

DECEMBER FIGURES.

Total output	695,137 ozs.
Value	£2,952,755
Decrease	20,699 ozs.
Value	£87,922
Witwatersrand	669,075 ozs.
Value	£2,842,048
Decrease	16,375 ozs.
Value	£69,557
Outside Districts	26,062 ozs.
Value	£110,707
Decrease	4,324 ozs.
Value	£18,365
Total stamps	9,807
Decrease	37

The output of £35,588,075 for the Transvaal compares with £37,388,040 last year and £38,757,560 in 1912. There was a decrease in the number of natives employed by the W.N.L.A. and contractors. 164,650 "boys" were so employed as against 166,039 in November, and 170,438 in October.

INDIVIDUAL RETURNS

	Ozs.	Value.
Aurora West	4,229	£17,963
Bantjes Consolidated	5,552	23,583
Barrett	291	1,236
Brakpan Mines	17,595	74,739
City and Suburban	11,727	49,813
City Deep	21,142	89,805
Consolidated Langlaagte	15,224	64,667
Consolidated Main Reef	8,290	35,214
Crown Mines	53,079	225,465
Durban Roodepoort Deep	7,679	32,618
Durban Roodepoort	3,556	15,105
East Rand Proprietary	48,109	264,354
Government G.M. Areas	10,730	45,579
Fairview T.C.L.	587	2,494
Ferreira Deep	18,464	78,430
Geduld Proprietary	8,161	34,666
Geldenhuis Deep	14,511	61,639
Ginsberg	3,793	16,112
Glencairn	3,501	14,872
Knight Central	5,978	25,393
Knights Deep	18,288	77,682
Langlaagte Estate	14,460	61,422
Luipaardsvlei Estate	4,344	18,452
Main Reef West	6,100	25,911
May Consolidated	2,230	9,472
Meyer and Charlton	7,876	33,455
Modder B.	18,045	76,650
New Goch	7,477	31,760
New Heriot	5,719	24,293
New Kleinfontein	16,084	68,321
New Modderfontein	23,130	98,250
New Primrose	5,286	22,454
New Rietfontein	1,753	7,446
New Unified	3,192	13,559
Nigel	3,533	15,007
Nourse Mines	14,720	62,527
Princess Estate	6,442	27,364
Randfontein Central	56,541	240,171
Robinson G.M.	18,853	80,083
Robinson Deep	16,542	70,266
Roodepoort United	7,412	31,484
Rose Deep	16,164	68,660
Rietfontein (T.C.L.)	316	1,342
Simmer and Jack	20,444	86,841
Simmer Deep	12,261	52,081
Spes Bona Tribute	786	3,338
Van Ryn Deep	17,597	74,747
Van Ryn G.M.E.	11,657	49,516
Village Main Reef	8,761	37,214
Village Deep	16,618	70,589
Vogelstruis Estates	3,249	13,801
West Rand Central	763	3,241
West Rand Consolidated	7,737	32,865
Witwatersrand G.M.	12,468	52,961
Witwatersrand Deep	13,352	56,715
Wolhuter G.M.	9,580	40,693
Sub Nigel	2,218	9,421
Sheba	2,952	12,539
Worcester Exploration	1,142	4,851
Quest	609	2,586
Ceylon Lydenburg	192	816
Glynn's Lydenburg	1,524	6,473
Transvaal G.M. Estates	7,054	29,963

Middleburg Steam Coal.

PAYMENT OF A FINAL DIVIDEND OF 3D. PER SHARE RESOLVED UPON.

Presiding at the ninth ordinary general meeting of the Middelburg Steam Coal and Coke Company, held in London in mail week, Mr. A. Cadell said, in moving the adoption of the report, that it had been a very critical year for all Transvaal undertakings, as they had had two disastrous strikes during the period. The company was not directly affected by those strikes, but the indirect results had been a diminution in demand, disorganisation of railway facilities, and some increase in cost. Coal sales showed a reduction of 13,828 tons as compared with the previous year's output, while the net profits of the colliery were £19,264, as compared with £19,740. From the profits they had transferred £2,500 to reserve. They had paid the debenture interest and preference dividend and an interim dividend on the ordinary shares, and they had a large balance of £23,124 at credit of profit and loss account. At the outbreak of the war the board found itself in a very difficult position with regard to its subsidiary venture, the Transvaal Gold Trust, which company was developing the gold claims at Pilgrims Rest. Although a very promising new reef had just been discovered on the property, they had very reluctantly come to the conclusion that they must concentrate their work on the colliery and conserve their resources. Mr. A. T. Macer said that the number of shares which the company held in the Transvaal Gold Trust was rather less than 50,000 less than half the issued capital. Unfortunately, the Pilgrims Rest claims had not been placed on a profit-earning basis. The board came to the conclusion that the profits of the Middelburg Company should not be further hypothecated to the financing of the claims. Hitherto they had held the claims on the ordinary mining licenses, which were very onerous. They had spent £5,000 on claim licenses, and had applied to the Government to refund them part of the money. If the Government saw their way to refund a portion of the £5,000 already spent in that way, there would be a good case to go to the Transvaal Gold Trust shareholders with a scheme of reconstruction. As a company they did not follow their shares in that reconstruction. On the other hand, the shares might have possibilities, and it was certainly not a disadvantage to a shareholder to have the opportunity of saying whether he would speculate 1s. or 1s. 6d. per share

Rhodesian Section.

LATEST MINING NEWS.

Rezende Mines—New Rhodesia Mines—South African Prospecting and Concessions—Hay Gold Mining—Rhodesian Industrial Progress—

The results of operations at the Rezende Mines for the month of December, 1914, were as follows:—Estimated profit: Central Section, £2,004; Old West Workings, £636; total, £2,640.

* * * *

During the year ended June 30, 1914, all operations were suspended at the Hay G.M., the policy of the board being to conserve the resources for any possible future undertaking. The accounts for the year show a net expenditure in South Africa and London, including depreciation, of £5,564, against which has been placed the credit to profit and loss of £3,171 as at June 30, 1913.

* * * *

The report of the New Rhodesia Mines for the year ended May 31, 1914, states that, owing to the poorness of the returns, the Kameel mine was let on tribute on a basis of a 17½ per cent. royalty; but the tributers have been working at a loss and have terminated their agreement. The Howard and the Imani claims are still being worked under tribute. The British Metal and Mining Corporation of Scandinavia, Ltd., who are the owners of the Husvik lead and zinc mines, in which this company is largely interested, reports delay in production at the Husvik, owing to the non-delivery of the Hommel leaching plant from Germany. Other processes are under consideration. The ore body is sufficient, as shown by present developments, to fully supply a leaching plant capable of a 5,000 tons capacity annually, the production being zinc-oxide 65 per cent. = 1,500 to 1,600 tons and 325 to 350 tons lead. The engineers recommend an increase, when further development has been carried out, to 15,000 tons capacity. Porcupine "Krist": Notwithstanding the war, work is in no way interfered with. On the immediate northern boundary of the Krist and South Thompson the lodes are being worked, showing good widths and values. The board are satisfied that a continuation of this development will prove the values of the Krist-Thompson claims.

* * * *

In the King's Bench Division, in mail week, Mr. Justice Coleridge and a special jury had before them an action for alleged libel, in which Mr. William Charles Ernest Gibson, a half-commission agent, living at Woodville Gardens, Ealing, sued Mr. Arnold J. Marks, of Palmeira Square, Hove, who promoted the South African Prospecting and Concessions Syndicate, Ltd. Mr. Gibson alleged that Mr. Marks, when managing director of the company, libelled him in circulars which he (the defendant) issued to the shareholders. The defence was a denial that the words complained of were libellous, and there were alternative pleas of justification and privilege. Mr. Schwabe, K.C., Mr. Lionel Benson, and Mr. S. P. Kerr were for the plaintiff; Mr. Marks, personally, defending himself. Mr. Schwabe said Mr. Gibson was a director of the South African Prospecting and Concessions Syndicate, Ltd., which owned the Empress-Palmeira Gold Mine in Rhodesia. Mr. Marks promoted the company, and at one time was managing director. The whole matter dated from 1910, when a Mr. E. H. A. Cohen was sent out to South Africa as a mining engineer, and the general manager of the company in South Africa. He made glowing reports about the mine which were confirmed by other engineers sent out at different times. The mine was supposed to be a valuable gold mine, and it had, in fact, got a great deal of gold in it, some of which was being extracted regularly now. Mr. Marks went to South Africa in 1912, and Mr. Gibson was appointed as alternative director in the defendant's absence, and on the latter's return Mr. Gibson remained on the board. It was then that Mr. Marks issued a series of circulars, on which this action was based. The first circular, issued in February, 1913, contained the following passages:—"Serious trouble has arisen on the board since Mr. Gibson was appointed thereto. This gentleman, I understand, is termed on the Stock Exchange a 'half-commission' man, which is quite a respectable calling. . . . On my arrival in England in July last and ever since, Mr. Gibson has been the means of constantly harassing me, and this so gravely interfered with the syndicate's business that but for the support of Mr. Coyler (another director), in my opinion the syndicate's future—notwithstanding its splendid properties—would be jeopardised." The case is proceeding.

* * * *

In the course of his speech at the annual meeting of the Chartered Company, Sir L. Starr Jameson said: "I told you at our last general meeting twenty-one months ago that we were undertaking large schemes of development and spending your money largely in the interests of the shareholders. As you will see from the report, we have done it, and so far we are thoroughly satisfied with the results. These schemes of development have been laid down on thorough business lines. They are all now in active operation, and that they are, as far as we can see, going to be successful is due to the change which you sanctioned at the last meeting, namely, the creation among the board of an executive committee what we call whole-timers. It appeared an expensive luxury at the time; it meant that four directors had to give their entire time to the work of our company; but our operations were extending so much that we felt it was justified, and I can assure you that nothing we have ever done has been better justified, notwithstanding the expense, than the appointment of this executive committee. Our ranching, as you will see, has made a large step forward. We are at present, I believe, the largest individual owners of cattle in the whole of South Africa. Of course, we have to wait perhaps a term of years before we get adequate returns. You cannot build up 200,000 or 300,000 head of cattle in a year. What we look to from our ranching in the future is an export trade in meat. As I told you before, it was on the advice of experts on the meat trade, and after careful investigation of the country by experts, that we started this industry in Rhodesia, and we have no reason to regret it up to now. Our citrous industry, on the same large scale, is well on the way; our tobacco industry has gone on so well that we have overstepped our market in South Africa; but that was to be expected. There has to be an interregnum while you are establishing your markets oversea. The individual grower, perhaps, was a little disappointed; but we are beginning to establish our markets overseas, and we look with confidence to the future of the industry. In the last few months we have already sold 500.000 lbs. of Rhodesian tobacco in the London market, at prices which compare extremely favourably with that obtained for tobacco from other foreign countries. Incidentally, also, I might say that, with regard to our export trade, which, as you know, has been our main object, and which we expect to be successful in now that we have the co-operative movement thoroughly started in Rhodesia, in the last three or four months we have sold in the London market 120,000 bags of maize. Accessory to this large industry we have also got in good working order our creamery, our bacon factory, our oil-seed factory, and other industries, while the mineral future has quite come up to the expectation which I led you to have at our last meeting. I announced then that there were several large companies that were only in the development stage, and would come to the fruition stage during the present year. That has occurred, and I am glad to be able to announce to you that our mineral output is estimated at the end of this year—that is, at the end of this month—to come up to £4,000.000 per annum."

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THE WEEK IN THE SHAREMARKET.

A Broadening Tendency—Dividend Payers and Far East Rand Shares in Demand.

The best feature of the week has been the broadening tendency, attributable to London buying. The declaration of the December output, bringing the production for the year to over £35,000,000, has had an excellent effect in London, and has drawn attention, as nothing else could, to the sound position of the industry. Far East Rand shares have been in some demand, in view of the prospects of that area, and some selling of State Mines has been seen. There is nothing wrong with that property, and holders should not be frightened out of their shares by empty rumours. Modder Deeps remain in favour, and everything seems to be going on well with the plant. Tin shares have been enquired for, and base metal prices seem to be improving in London. The latest cables quote on the London Metal Exchange standard copper at £59 17s. 6d. per ton; electrolytic, £63 15s. per ton; Straits tin, £152 10s. per ton for cash, and £146 10s. per ton for three months' delivery. Diamonds remain in the doldrums, and the fact of the German Regie offering a big parcel for anything it may fetch is not likely to improve matters.

* * * *

	Fri., 8th.	Sat., 9th.	Mon., 11th.	Tues., 12th.	Wed., 13th.	Thurs., 14th.
Adair-Ushers	—	0 3*	—	0 3*		0 3*
African Farms	8 9*	8 9*	8 6*	8 9*	9 0	8 9*
Apex Mines	—	—	14 0†	13 9†	13 9†	13 9†
Brakpan Mines	—	43 6*	43 6*	43 6*		
Breyten Collieries	—	20 0*	20 0*	20 0*	20 0*	
British South Africa	—	12 0*	—	12 0*	—	12 0*
Bushveld Tins	0 4*	0 4*	—	—	0 5*	
Cinderella Cons.	2 6*	—	—	—		
City and Suburbans	40 6	40 0	39 9*	40 3*	40 9*	41 3
City Deeps	55 6	55 0*	55 6*	56 0*	56 0*	55 6*
Cloverfields	3 9*	3 9*	3 9*	4 3	4 3*	4 3*
Clydesdale Collieries	—	—	—	—	7 6*	8 6
Cons. Langlaagtes	31 3*	—	31 6*	31 6	32 3*	32 0*
Cons. Main Reefs	16 3*	—	16 3*	16 6*	16 6*	16 9*
Coronation Collieries	18 0*	18 0*	18 0*	21 0*	21 0*	
Coronation Freeholds	0 4†	—	—	—	—	—
Crown Diamonds	—	1 6*	—	1 6		1 6*
Crown Mines	90 0†	—	—	—	87 6†	
East Rand Centrals	2 1*	2 1*	2 1*	2 1*	2 3	2 3
East Rand Coals	1 7	—	1 6*	1 6*	1 7*	1 7*
East Rand Deeps	1 3*	1 4*	1 4*	1 5*	1 4*	1 5
East Rand Props.	29 0†	—	—			28 6
East Rand Debentures	£85*	—	£85*			—
Eastern Gold Mines	0 11*	1 0*	1 0*	1 0*	1 0*	1 0*
French Rands	—	1 0†	—	—	—	—
Frank Smith Diamonds	1 3*	1 4	1 3*	1 3*	—	1 4*
Geduld Props.	19 6*	20 0*	20 0	20 3*	20 9	20 3*
Glencairns	—	1 0*	—	1 0*	—	1 0*
Glencoe Collieries	—	—	5 9*	5 9*	5 9*	—
Glynn's Lydenburgs	9 6*	9 6*	9 0*	—	—	9 6*
Government Areas	19 6	18 9	18 6	19 0	19 6	19 9
Jupiters	—	3 0*	—	—	—	4 0†
Kaalfontein Diamonds	—	—	0 3*	0 3*	—	0 2*
Klerksdorp Props.	—	3 0†	—	2 6†	—	2 6†
Knight Centrals	5 6*	5 6*	5 6*	5 6*	5 7*	5 6*
Knights Deeps	—		30 0†	29 0†	—	30 0†
Lace Props.	2 9*	2 9*	2 9*	3 1*	3 6	3 3*
Luipaardsvlei Estates	10 0†	6 0*	—	—	7 0*	10 0†
Lydenburg Farms	2 3*	2 6*	2 6*	2 6*	2 6*	2 6*
Main Reef Wests	—	—	—	5 6*	—	5 9*
Middelvlei Estates	—	1 0*	1 0*	1 6*	—	1 6*
Modderfontein B.	—	80 0*	80 6*	81 0*	81 0*	81 3*
Modderfontein Deeps	59 0	60 0	58 6	59 3	59 6*	59 9
New Boksburgs	—	—	—	1 0†	—	—
New Era Cons.	—	—	—	4 8*	4 7*	5 0
New Geduld Deeps	—	2 0†	1 9*	1 9*	1 9*	2 0†
New Gochs	—	—	—	12 0*	—	12 6*
New Heriots	58 0*		—	—	60 0*	59 0*
New Kleinfonteins	19 6	19 9	19 3*	19 3*	19 6	19 3*
New Modderfonteins	250 0†	246 3*	247 6*	247 6*	247 6*	—
Orange Diamonds		0 9*	1 0†	0 6*	0 7*	0 6*
Pretoria Cements	—	—	40 0†	40 0†	39 0*	39 0*
Rand Klips	2 7*	2 6*	2 8*	3 0	3 3*	3 0
Rand Nucleus	1 5*	—	1 6*	1 6*	1 6*	1 7
Randfontein Deeps	2 9*	—	1 0*	2 9*	3 6†	2 10*
Roberts Victor Diamonds	—	7 6*	—	—	—	—
Rooiberg Minerals	20 0*	20 0	20 0*	20 0*	20 6†	19 0*
Roodepoort Uniteds	—	4 0*	7 0†	7 0†	6 0†	6 0†
Ryan Nigels	1 0*	—	—	—	—	—
Shebas	3 0†	—	3 0†	3 0†	—	—
Simmer Deeps	—	—	1 0*	1 0*	1 0*	1 0*
S.A. Lands	2 3*	2 6†	2 3*	2 3*	2 6†	2 3*
Springs Mines	—	12 0*	12 6	12 6	12 6*	12 6*
Sub Nigels	8 6*	—	8 6*	8 9*	—	8 9*
Swaziland Tins	20 0*	20 0*	20 0*	20 0*	20 0*	20 0*
Transvaal Coal Trust	27 0*	—	—	—	27 0*	—
Transvaal G.M. Estates	—	—	—	—	35 0*	—
Van Ryn Deeps	44 9	44 6	44 3*	44 3*	44 9	44 6*
Village Deeps	—	37 0†	—	35 0*	35 0*	—
Witwatersrands		—	—	—	—	58 0*
Witwatersrand Deeps	36 0*	37 0*	—	—	—	—
Wolhuters	12 1*	12 3	12 1*	12 1*	12 0*	12 0*
Zaaiplaats Tins	21 0*	21 0*	21 0*	21 6*	21 0*	—

*Buyers. †Sellers.

Geological Society.

The nineteenth annual general meeting of members of the Geological Society of South Africa will be held in the Council Chamber, Chamber of Mines, Johannesburg, on Monday, 25th January, 1915, at 8.30 p.m. Business: (1) To receive and consider the annual report and statement of accounts for the year ending 31st Dec., 1914. (2) To elect 13 members of Council in place of Messrs. Geo. S. Corstorphine, L. de Villiers, J. Jervis Garrard, W. J. Gau, W. G. Holford, C. B. Horwood, E. Jorissen, T. N. Leslie, D. P. McDonald, Paul Range, A. R. Sawyer, S. J. Shand, and P. A. Wagner, who retire under the rules of the society. (3) To elect a president, vice-presidents, and honorary secretary for the ensuing year. (4) To elect an auditor for the ensuing year. Mr. David P. McDonald will deliver his Presidential Address.

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Transvaal G.M. Estates.

The secretaries write:—The following cablegram has to-day been despatched to our London office for publication: "The general manager reports that owing to the recent heavy rains the profits of the Central Mines will probably be adversely affected for some time. A number of adits have been blocked, and ground has subsided in some of the workings. Some of the labour force, which has lately been inadequate even for current operations, has had to be diverted from current mining to repair work. The payable zone is still extending to the dip in Duke's Hill South, but the reef has recently decreased in value and width. At Vaalhoek and Elandsdrift the water has caused some trouble, but results should not be materially affected."

The Sheba.

The following are the results of operations of this mine for the month of December, 1914: "Crushings for the month, 7,330 tons, yielding 2,952 ozs. Estimated profit, £3,805."

Main Reef West.

During the quarter ended the 30th of September the Main Reef West produced gold to the estimated value of £79,733 12s., the total working costs being £66,974 17s. 6d., equal to 20s. 3·177d. per ton. The profit was £12,758 14s. 6d., or 3s. 10·325d. per ton.

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Engineering Notes and News.

A Modern Refuse Destructor.

In methods for the destruction of refuse, Johannesburg takes a prominent place in comparison with other cities. An instance of the enterprise of the Municipality is seen at Newtown (says a contemporary). The old destructor, which had been in use for about ten years, has been pulled down, and one of a new design substituted, which varies considerably from any other existing destructor, giving a much larger storing capacity and a very easy pull through. In many refuse destructors it is a great disadvantage that the refuse has to be taken along the same way by means of heavy inclines and so on, but at Newtown the exit is remarkable for its simplicity, being all on the straight. The number of cells has been doubled; formerly there were eight, now there are sixteen. The burning capacity is forty tons per cell a day. Johannesburg has three refuse destructors one at Natal Spruit, one at Norwood, and one at Newtown. That at Newtown is the best. The rubbish is tipped from a platform, 47 feet in width over a beam on to a floor at a level of about 12 feet lower. On the far side of this floor are furnaces, into which the rubbish is shovelled. An artificial draught is created by steam jets, and steam is supplied from four B. and W. tubular boilers, which are heated from the refuse furnaces, the boilers being situated between the furnaces and the chimney stack. The flues are so arranged that the heat can be passed either partly or wholly through the four boilers, each serving four cells which can work independently. The brick-built chimney-stack is an uncommonly large one for a refuse destructor, being 100 feet in height above ground. It has a diameter of 7 feet at the top, and 8 feet at the base. The concrete footing is 32 feet by 32 feet by 4 feet. The whole of the cast iron work for this destructor has been done locally. All of the buildings are carried out in brickwork, and the roof is of iron with a cover of corrugated aluminium sheeting, as corrugated iron would not stand the fumes from the destructor. The new destructor, which cost £29,323, has given excellent results so far, and is a great credit to the Town Engineer's Department. The construction of the building has been well carried out, and particular care has been taken in regard to the foundations, and so forth. The work was done under the direction of Mr. G. S. Burt Andrews, Town Engineer, Mr. B. W. J. Rade, Chief Engineering Assistant, and Mr. G. T. Hill, Clerk of Works. It is claimed that there is no better refuse destructor anywhere, and the efficient manner in which the refuse is dealt with has even exceeded expectations. To make the surroundings as attractive as possible has been a factor in the scheme, and special regard has been had to the comfort of the workmen.

Hydraulic Stowing in the Gold Mines of the Rand.

At the meeting of the North of England Institute of Mining and Mechanical Engineers, held at Newcastle-on-Tyne in mid week, a discussion took place upon the paper bearing the above title, read at a previous meeting by Mr. B. C. Gullachsen.

Mr. George Rice (United States Bureau of Mines, Pittsburg) wrote that one statement made by Mr Gullachsen was open to question. He had written: "As is well known, Upper Silesia has the credit of being the birthplace of hydraulic stowing. Even if it had been employed on a small scale at a previous date in other parts of the world, it remained for Herr Bergrat Williger to introduce it on a large and economic scale at the Myslowitz Mine in Upper Silesia during the year 1901." There was, however, said to be on record an instance of hydraulic filling in 1884 in the anthracite district of Pennsylvania for the purpose of extinguishing a mine fire, and in [illegible] (according to Bulletin No. 60 of the United States Bureau of Mines) the system was adopted to prevent subsidence under a mining village. Again, according to this Bulletin, it was employed in 1887 to provide surface support at the Koh-i-noor Colliery, Shenandoah (Pennsylvania), and was introduced in the northern anthracite field in 1891 (see report of the Bureau of Mines Department of Internal Affairs of Pennsylvania for 1897). Hydraulic stowing methods were so far advanced in this district by 1893 that a party of German engineers from the Upper Silesian coalfield visited the region in that year in order to investigate the system, and it was understood they recommended its adoption in the Upper Silesian mines. The problem of supporting the surface was a very serious one in some localities in Pennsylvania, as the region was densely populated, and in consequence there was much litigation and trouble, particularly in the city of Scranton. There were under this city from four to eleven workable coal seams, the thickness of which aggregated 60 to 80 feet in a total depth of strata of 300 to 700 feet under the central parts of the city. In 1910 there were 27 active collieries within the city limits, and from these mines 221,000,000 tons of coal had been extracted. It was estimated that the extraction of this coal, with the accompanying refuse, represented an amount that was larger than that taken from the Panama Canal. Some dry filling and some hydraulic filling had been carried out, but it was thought that half the space still remained open, as the roof material of most of the coal seams consisted of a hard strong sandstone. Mining was continuing under the city at a present rate of 6,000,000 tons per annum. Under such conditions there had necessarily been serious subsidences from time to time, and many buildings had been wrecked, although, fortunately, accompanied so far with practically no loss of life. These subsidences had led to much litigation and trouble between the city of Scranton and the surface property owners on the one hand and the coal operators on the other, who for the most part owned the underlying coal. In some cases compromise agreements had been reached; in certain special cases artificial pillars had been built in the old mine workings, and some hydraulic filling done, but no broad comprehensive plan had yet been agreed upon. Most mining engineers who had investigated the situation, including the writer and other engineers of the United States Bureau of Mines, believed that in hydraulic filling lay the only solution.

Mr. James Gibson (Cleveland, Transvaal) wrote that Mr. Gullachsen was scarcely explicit enough in regard to the pipes used and the positions in which certain kinds gave the best results. To avoid repeating the experiences which had been unfavourable, it was necessary that the suitability of the various kinds of pipes when used in different ways, with due reference to their cost, life, and maintenance, should be well understood before a decision was arrived at to use any one or more than one kind. On the Rand steel pipes were the most usual and not cast iron pipes, which were not much used except perhaps when fixed vertically. In any case, the life of pipes in the vertical portions of the shafts was short. Wood-lined pipes were largely used at first, but were found to be very troublesome, and were now hardly employed at all. The other specially lined pipes were not used to any extent, as steel pipes had proved the most satisfactory, and in flat places had a very long life, although they also were cut rapidly when in the vertical position. Generally speaking, sand-filling on the Rand had not been undertaken as an economically successful venture, but to safeguard shafts, workings, and certain important areas and works on the surface. In this respect it was different from a coalfield, in the mines of which the [illegible] varied, and in most cases also of the overlying strata, differed so widely in themselves. Between these again and the hard resistant quartzites of the Rand there was a great difference. On the Rand only 6 per cent of the area mined could be left in the way of pillars, etc., whereas in a coal mine the area might easily amount to 30 per cent, a quantity of valuable material large enough to practically put a hydraulic filling scheme on the basis of a sound commercial undertaking.

CENTRIFUGAL v. RECIPROCATING PUMPS.—II.

Successful Centrifugal Pumping Plant at the Durban Roodepoort Deep and Its Lessons—Important Discussion.

THE valuable paper read by Messrs. E. G. Izod and A. D. Roullard, at the last meeting of the S.A.I. of E., on the Centrifugal Pumping Plant at the Durban Roodepoort Deep, evoked the following discussion:—

Mr. H. Stuart Martin said he had always been in favour of reciprocating pumps for these fields on the ground of reliability. A breakdown of the main pump station at a gold mine was a serious matter, particularly where, as in some cases, mines turned out a profit of over £1,000 a day. Centrifugal pumps have been used with success in the coal areas for some years. However, the proposition was quite different when considering the nature of the water to be dealt with on these fields, containing, as it did, large quantities of acid and grit, and therefore great credit was due to those people in charge of the new pumping station of the Durban Roodepoort Deep, Ltd., who, after twelve months' trial, are able to say they have had no trouble at all. The only question he would like to put to the authors, after their twelve months' experience of centrifugal pumps on that mine, and considering there is practically no difference in running costs of either type, would they, on the grounds of reliability alone, advocate centrifugal pumps? Personally he was not yet convinced that they were running equal risks in adopting centrifugal pumps and reciprocal pumps, and was still inclined to favour the latter in spite of their higher first costs. The higher first costs and extra room taken by reciprocating pumps, in his opinion, was secondary to liability to breakdown and consequent loss in profit. The duplication of sump rooms was a good point, in order that one sump might always be kept clean and free from water and ready for any emergency. The speaker had had experience of large storage sumps being cut, and at the time of breakdown the sump was either full of water or mud. The duplication of the pumps and pipe columns at an important station, such as this, was certainly advisable. However, the inclination to duplicate machinery, plant, and shafts, on these fields, in his opinion, had been overdone. The speaker was not prepared to discuss the paper that evening, but wished simply to congratulate the authors in bringing to the notice of members a subject of great interest and importance, supported by careful records over a substantial period, and he hoped after careful study of the paper to discuss it at another meeting.

Mr. E. J. Laschinger said that one of the points the authors brought out was that the question of shaft water pumping on the Rand had not received the attention it deserves. The paper should be a very useful stimulus to mining men and engineers to go more deeply into the matter. Looking at it from the water point of view, he did not know whether many engineers on the Rand quite realised its importance. Referring to a report made some years ago to the Chamber of Mines on the water proposition alone, the speaker said the figures showed that over 60 per cent. of the water consumed in reduction purposes on the mines came from shaft water; and furthermore that if we did not have the shaft water we would not be able to operate our mines at all on the scale we do to-day. That is one reason which adds great weight to the argument that engineers generally should study the mine water proposition more thoroughly than they have done in the past. It also recalls to mind the fact that if one goes through statistics of the various mines of the water raised to the surface, they will be found to be somewhat unreliable. Engineers estimate water in different ways, from no per cent. slip to 30 per cent. slip on the pumps, and then they sometimes rely on the word of the Kaffir as to how long the pumps actually did run. That is one of the arguments why the water proposition on the underground properties of the Rand should more thoroughly be gone into. Another point is, he did not think the authors had done the centrifugal pump justice, because with the concentration of pumping to which they refer, it means that, as in the case of turbines, as against reciprocating engines or turbo compressors *versus* reciprocating engines, the larger the capacity of a single unit, the greater is the advantage to the centrifugal machine; a centrifugal pump of 300 or 400 gallons per minute capacity is a very small unit indeed. It is quite easy to build a 2,000 or 2,500 gallon-a-minute pump, which in a single unit of the reciprocating type for mine pumping would be out of the question. The parts would not go down the shaft. They also knew that in large units they got much more efficiency. This is seen by comparing the over-all efficiency of the pumps as erected at the Knights Deep with the centrifugal pump; and it is explained by the fact that the centrifugal pump at present used is a small unit. If there is only a small amount of power to use, or a small unit to instal, the reciprocating unit has its advantage against the turbine, but in large units (in the large industrial operations of the day) the centrifugal unit scores at once. Coming to large units for pumping plant for underground work, the centrifugal unit would have a very large pull over the installation of reciprocating units. The *sine qui non* of success in centrifugal units has been elaborated by the authors, and that is the cleanliness of the water. No engineer with experience of mine pumping, even if he went back to the Cornish pumps, would deny that if one wants to have a successful pumping plant one must have his water as clear as possible. That should be considered apart from centrifugal or reciprocating pumps. The questions of pump capacity, clear water, the removal of grit, the importance of neutralising mine water are ones that should be the subject of a special paper, and be enquired into by engineers on the Rand. From recent experience it is known that the neutralisation alone, apart from cleansing, saves itself over and over again in the cost of renewals of pipe lines and pumps. The centrifugal pump cannot act successfully in dirty water, and it is also known that in ram pumps the valves cut out so frequently with dirty water that there is great expense and loss of efficiency in attending to the working parts. Professor Lawn has brought up a point about cleanliness and the lighting of stations. Those whose experience goes back some years think these are essentials throughout all mining operations. In pumping chambers, winding chambers, and shaft stations, and also in mills and cyanide works and everything connected with a mine, there should be cleanliness, light and ventilation. They are absolutely essential to efficient and economical operations. I think it should be especially emphasised with regard to underground plant, which is in places very often kept in the dark, and on which of course a great deal of light should be thrown in order to improve the general conditons underground. The speaker concurred with Mr. Stuart Martin in that he should be very pleased after careful perusal of the paper and thinking over the various points, to enter the discussion again at a future meeting, after having given due consideration to the various points thrown out by the authors to whom they were all very much obliged. Their paper is one that has opened a subject of great importance to mining on the Rand, especially in view of the deeper and deeper depths to which they were going, and the greater expenditure they are incurring in handling rock and water.

Mr. J. H. Rider remarked that as officially partly responsible for the pumping plant described he had nothing to add to what the authors of the paper had said. But for the general enlightenment of the members he thought it would be a good thing if the authors would tell them how they measured the water this pump delivered. Mr. Laschinger had spoken of the way that some waters were measured, and if this pumping plant had accurate methods of measuring water it was well that they should be known to members.

Mr. R. C. Atkinson said that Mr. Laschinger had very fully covered many points that had occurred to him (the speaker), and therefore it would merely be reiteration to go over them again. He thought that Professor Lawn made a strong point when he referred to the quantity of water required before the centrifugal pumps could be installed and even considered, mining as it had been carried on on

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the Rand, and especially in the early days of its history, when they only dealt with water from the outcrops, did not call for very large pumps. It demanded pumps of quite small size, and the water was not of sufficient quantity at that time to allow them to consider centrifugal pumps, even if centrifugal pumps had at that time arrived at the efficiency that they possessed to-day; therefore naturally reciprocating pumps were installed, and as the authors themselves said, reciprocating pumps had been good friends of the mining man as well as of the engineer. He was quite sure that most of us had come to the conclusion, and would have received a general impression in listening to the paper, that the saving clause in the whole pumping position was clean water. Clean water had only been obtained by making very large pumps. In the past when they talked about putting pumps underground, if they dared to ask for more than a hole in the ground as a sump, they very rapidly had the mine engineer on their track. It was thought that as long as we had a hole to run water into, and the pump was kept plugging away, that that would be quite enough, and as a matter of fact a pump was expected to lift rock as well as water, and did it very efficiently. The sumps were actually three-quarters full of mud, with a little water on the surface, and very frequently one had to lift up the suction pipes to clean the sump, to get the pump going at all. He thought the authors were to be complimented upon the courageous attitude they had taken in putting down centrifugal pumps at the Durban Deep with their knowledge of the Rand available; that was to say, with the knowledge or the practice and experience which was really wanting as far as centrifugal pumps were concerned in the working of the mines on the Rand. It was altogether a different thing to instal pumps in a coal mine, with clean water, the nature of the dirt was not so injurious to the pumps and their parts as the gritty substance they got in the mines of the Rand. He questioned whether centrifugal pumps could be considered here unless one concentrated the pumping schemes, and it was no use putting centrifugal pumps in on most of the mines because they must have sufficient water to deal with. The quantity must be nothing less than they had at the Durban Roodepoort Deep before centrifugal pumps could be considered.

(To be continued.)

Commerce and Industries.

The Mining Material Trade.

The total imports of mining material in 1913 were valued at £1,799,758. There were decreases in only two items, to wit, detonators and fuse, which fell by £12,000; and blasting compounds, £11,400. The principal increases to be noted were: Cyanides of sodium and of potassium, by £27,300; wire ropes, £18,700; mining machinery, £76,200; tip-trucks and mining buckets, £16,600; which make, together with other minor differences, a net total increase in the whole class of £197,000. In his report for the year, Sir R. S. Holland says: "The classification 'mining material,' as adopted for purposes of this report, must not be accepted as including all articles of import consumed by the mining industry. The figures shown represent but a fraction of the total purchases of the mines, since it is impossible, in an analysis of the trade returns, to determine what proportion of certain goods whose import values are recorded, is destined for consumption in mines, and what proportion for other purposes. For example, foodstuffs, timber, hardware, iron and steel, and tools are all largely used by mines, but they are also in general demand. Such goods are included in other classes to which they can, however, more justly be credited. For the same reason, electrical material was placed in a special class of its own, seeing that, although the mines are consumers to a considerable extent, municipalities, tramways, etc., are also important buyers. The 'mining' class, therefore, only includes goods (such as mining machinery, mining buckets and tip-trucks, tanks and vats, battery cloth, wire ropes, etc.), which are known to be almost solely for use in mining operations. Percental fluctuations in the total value of such imports, however, provide a very fair indication as to the progress or otherwise of the industry as a whole.

* * * *

Double Income Tax.

Mr. Charles Duguid, the financial editor of the *Daily Mail*, draws attention in a recent issue of that paper to the hardship inflicted on British investors through having to pay income tax both in South Africa and England on dividends. He says: Now that the shareholders in Stuttaford & Co. the Whiteleys or Harrods of Capetown and Johannesburg are receiving their dividends they are protesting against the deduction of Cape as well as English income tax. A holder of 500 shares, for instance, should receive £20 in respect of final dividend of 4 per cent., but he receives much less. First there is deducted the Cape income tax at 1s. 6d. in the pound, reducing the £20 to £18 10s. Then comes a deduction of the English income tax at 1s. 8d. in the pound, reducing the amount to £16 19s. 2d., and finally comes the deduction, in respect of the revised income tax, of 5d. in the pound on the dividend paid in July, which reduces the amount to £16 12s. 11d., instead of the £20 originally declared by the company. It is not unnaturally put forward as a hardship that shareholders resident here should have to pay their Cape income tax as well as their own. One shareholder contends that the directors should at all events treat the tax as a trade charge like rent, but it is doubtful if that would do much good, it would have to be paid just the same.

* * * *

British South African Trade.

The following statement shows the total value of the imports of merchandise and of the exports of South African produce, and also the total value of the imports and exports into and from British South Africa during the eleven months ended November 30th, 1914, as compared with the corresponding periods of 1913:—

IMPORTS.

	Eleven months ended Nov. 30, 1914.	
	1914.	1913.
	£	£
Via British Ports	25.833,471	31,114.876
Via Portuguese Ports	4.572.661	5,776,695
Total Merchandise: British South Africa	30,406,132	36,891,571
Gold, Raw, in Transit	36,657	18.867
Articles for South African Governments	3,752,491	2,992,529
Specie	827,319	837,194
Grand Total: British South Africa	35,022,599	40,740,161

PROPORTION OF BRITISH TO FOREIGN MERCHANDISE IMPORTED.

	£	%	£	%
From United Kingdom	17.275,334	56·8	20,234,498	54·9
From Other British Possessions	3.672,058	12·1	4.364.984	11·8
From Foreign Countries	9.458,740	31·1	12,292,089	33·3
Total	30,406,132	100	36.891,571	100

EXPORTS.

	Eleven months ended Nov. 30,	
	1914.	1913.
	£	£
South African Produce—Via Capetown:		
Diamonds	5,473.179	11,356,333
Gold: Raw	22,207,971	36,235,513
Other S.A.P.	1,375.045	1,447,292
Total: South African Produce	39,469.984	62,310,479

Owing to the disturbed conditions large quantities of raw gold and diamonds are not being exported, but are retained in the Union.

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Economic Situation in Germany.

The *Times* states that the Berlin correspondent of the *Handelsblad*, according to a Reuter telegram from Amsterdam, makes some interesting remarks on the economic situation. He says that the disturbance of economic life has caused far greater disorganisation in Germany than in 1870. German industry is now engaged in meeting disorganisation with reorganisation. The greatest losses have been suffered by the machinery, iron, coal, textile, sugar, paper, and chemical industries. For some industries the problem has been to shift the market for the goods. Other industries had to change the nature of their productions. The great organisations of manufacturers have set themselves "to avoid the dissipation of economic power and to utilise the available power in the most rational manner." They make joint applications when the Government asks for tenders, and are "generally successful in obtaining the orders." The great electrical concerns have to a large extent changed their articles of production. Factories which before the war produced iron railings or sewing machines are now manufacturing shells.

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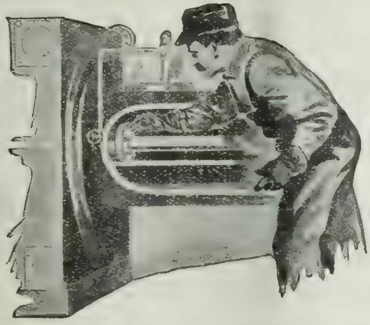

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The Diamond Industry.

The *Vossische Zeitung* learns from Antwerp that the Diamond Exchange will probably be opened in January, together with some of the cutting works. The majority of the Antwerp diamond dealers are still in Holland; only some of them have returned.

Piggs Peak.

The local secretary writes:—We beg to advise you that warrants in payment of the dividend of 2½ per cent., declared payable to shareholders registered on the 23rd December, 1914, will be posted to members registered on the local share register on Friday next, the 15th inst.

New Found Out Mines.

The report of the New Found Out Mines, Ltd., for the year ended June 30 last shows an excess to date of expenditure over revenue of £2,000. Owing to financial conditions it has not been possible to arrange for the erection of the treatment plant.

ANSWERS TO CORRESPONDENTS.

A. J. F.—The property is being carefully looked after, and operations will re-start when the share market recovers.

A. D.—Enquiries are being made.

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ESTABLISHED 1891.

VOL. XXIV., PART I.] JANUARY 23, 1915. [No. 1217.

HEAD OFFICE: 176-180, Stock Exchange Buildings, Fox Street (2nd Floor), Johannesburg, Union of South Africa.

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Notes and News.

Two New Natal Collieries.

The Natal Navigation Collieries, Ltd., the energetic Chairman of which, Mr. Dundas Simpson, is on a visit to the property, has taken up two important coal "propositions" in the Vryheid district. Both properties are on the new Piet Retief—Vryheid railway and will thus be accessible in two directions. One property is the Makateeskop deposit in the Paulpietersburg district, which is described as an especially large and rich deposit of coal of excellent quality. The other property is the Dumbe Mountain, from which coal of good quality has been extracted for some time. The properties will be worked as separate producers under the aegis of the Natal Navigation, which is in excellent financial position, and their equipment should give a much-needed fillip to colliery plant suppliers.

* * * *

Luipaardsvlei and Frank Smiths.

At the annual meetings of the Luipaardsvlei Estate and of the Frank Smith Diamond and Exploration Co., Ltd., held recently in London, very detailed and informative accounts were given of the position and prospects of the properties. By careful management and good fortune, the position of the Luipaardsvlei has been greatly strengthened, and the prospects were never brighter than to-day. The story of the Frank Smith mine is equally chequered, but its trouble to-day is not at the mine, but is a market one, shared equally with the other diamond producers. A review of the proceedings at both meetings must, however, he held over till our next issue.

* * * *

An Imperial Conference and "The Big Thing."

Next to the war itself, the most hotly-discussed question of the moment is the re-adjustment of African boundaries that must follow it. In this connection, Mr. Samuel Evans, in a letter in the daily Press, makes out a strong case for the holding of an Imperial Conference in London during the war, in order that all parts of the Empire may come to a readier understanding in regard to the great question of the final settlement alike with friends and foes. No continent—not even Europe itself—is likely to be affected to a greater extent, territorially, by this war than Africa; and already imaginative minds are allowing themselves to dream great dreams of a federation of African States, embracing most of the Continent under the Union Jack. The theme is a most fascinating one, and we hope later on to give it more of the attention it merits. Meanwhile, South Africans will be well advised to support as strongly as possible the far-sighted suggestion made by Mr. Evans, which has already, we are glad to note, attracted the powerful backing of *The Times.*

* * * *

N.T.C. and Levers.

Messrs. Lever Brothers have made arrangements to secure a controlling interest in the New Transvaal Chemical Company. This union of working forces is obviously likely to be of advantage to both concerns, and it has long been expected. Doubtless the extension of the activities of the N.T.C., rendered possible by the war, has hastened the step. Levers already have soap works in this country, and this combination of the two leading soap makers in South Africa may have interesting results.

* * * *

H.E. Proprietary (New).

The directors report that the acquisition by the New Districts Development Co. of the H.E. Proprietary, Ltd., has been carried into effect, and the name of the New Districts Co. has been change to H.E. Proprietary (New), Ltd. For twelve months to October 31, 1914, the revenue from dividends, sundry profits, etc., was £8,854, and, after allowing for administration and writing off one-third of the preliminary and amalgamation expenses, there remains £5,431, subject to depreciation. The board have decided that the whole sum at credit of profit and loss account, amounting to £6,966, which includes the carry-forward from the previous year, shall be added to the reserve account, thus making the total £19,566, which sum, in the opinion of the directors, forms a substantial provision against depreciation.

* * * *

Toiling for Oil.

Shareholders in the Transvaal Oil Shale Syndicate, Ltd., have received a statement issued by the directors to the effect that they have delayed calling the annual meeting, as certain negotiations were proceeding as to which they hoped to be able to consult shareholders. These negotiations, however, have been considerably delayed, and the representative of the company sent from London has not yet returned. Accounts were submitted at a meeting held on the 30th ult. The accounts to June 30, 1913, showed a balance due to the vendors of £17,200 and cash only £627.

* * * *

Swiss or Cerman?

At the recent annual meeting of the Bank for Electrical Undertakings (Bank für Elektrische Unternehmungen), of Zurich, the question was raised for the first time in the comparatively long existence of this investment company, and apparently on account of the possible effects which the war may have in regard to the receipt or non-receipt of dividends or interest in holdings in supply and other undertakings in belligerent countries, as to whether the bank is a Swiss or a German institution. As is probably well known, the bank was formed originally with Teutonic assistance for underwriting capital, investing in undertakings, and in making advances to them, and certain German manufacturers, if not banks, have retained an interest in the bank down to the present moment. But with the lapse of time a remarkable change has taken place, and the preponderating portion of the very considerable share and loan capital, which was formerly held in Germany, is now in Swiss ownership. Apart from the Zurich bank, the same question may occur in the case of several other Swiss concerns, notably the Aluminium Industry Co., of Neuhausen, which has a branch works in Austria, and is also interested in a French undertaking which, we believe, furnishes a supply of bauxite. A large amount of the Neuhausen company's capital is likewise held in Germany.

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Natal Navigation Collieries.

The report of the Natal Navigation Collieries for the year ended June 30, 1914, states that last year prospecting rights over a further 4,400 acres were acquired. Prospecting work did not justify retaining 2,600 acres of this area, the balance of 1,800 acres, plus prospecting rights over a further 3,900 acres, leaves 5,700 acres still undecided. On a considerable portion of this area drilling has given satisfactory results. The balance of cash assets over liabilities at June 30 was £122,093, against £115,780 a year before. The total output (in long tons) was 310,479, against 316,508. The net profit on coal, coke, and sundry revenue was £45,602, against £42,776. The cost of options and drilling that did not disclose coal of commercial value, amounting to £1,933, has been written off. The balance standing to credit of development account pit 3, viz., £2,290, has also been written off.

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Springs and Eastern Areas.

Mr. Alfred Lewis writes to say that he has been fossicking around the Far East Rand, and as a result he seems to have arrived at some original views as to the possibilities of our State leases in that area. He states that the outcrops were poor and the reefs have become richer—not poorer as is often stated—at depth. If we look at the case of the Modder, Modder B., Kleinfontein, then this seems to be fairly correct, but he goes further and mentions the rich deepest levels, such as the Modder Deep and Springs Mines, as containing some of the richest ore that has ever been developed along the Rand, as is now proved by the latest assays from the latter mine. It is also fairly correct that our contact reefs now being developed out east contained little or no reef matter on or about the outcrop or sub-outcrops, but at depth the tonnages run from ten to thirty thousand tons per claim, which at 8 dwts. per ton and 14s. costs will yield " enough gold to pay our share of the war." His theory is that this payable rock is running in a " gutter " from the Modder to the Nigel in a zig-zag fashion.

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Fly-Breeding on the Mines.

The board of directors of the Rand Mines, Ltd., some time ago decided to award a semi-annual prize to the compound manager who was the most successful in the prevention of fly-breeding. The directors desire this prize to go to the man who has shown the greatest practical ingenuity and enterprise in fighting along effective lines the propagation of flies. Taking all these factors into consideration, the directors awarded the first prize to be given under the vote, a handsome silver cup, to Mr. S. McKenzie, the compound manager of the Crown Mines, Ltd. Mr. McKenzie has been instrumental in introducing in the compounds of this large property a very comprehensive and well-managed system of garbage collection, and has devised cheap and effective furnaces for the destruction of the garbage. The last is recognised as an especially noteworthy achievement, as it helps to solve the garbage disposal problem on the mines along satisfactory and economical lines. The next prize under this vote will be awarded during the winter months.

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The Copper Controversy.

To follow the copper controversy between Great Britain and the United States, it should be understood that copper shipments from the United States to Italy, if consigned " to order " or are proved to be destined ultimately to a belligerent, will be seized and detained by Great Britain. This was intimated by Sir Cecil Spring-Rice, the British ambassador, at a conference in Washington. The ambassador made the following statement: " The Italian Government has prohibited the export of copper from Italy, but not the transit of copper through Italy to a foreign country. Copper consigned by Italy for Italian use will not be subject to seizure, but copper which is consigned to a belligerent country or to order will be suspected. Arrangements are being made for the transit of copper to Switzerland for the use of that country on the ground of proper authorities." The British Government has found that Italy's embargo on the exportation of copper would not prevent a shipment originating in the United States from eventually reaching Germany. The Italian Government does not feel bound, according to the British understanding of the question, to interfere with a shipment from one country to another if Italian territory is merely used as an intermediary stage in the journey of a consignment of goods. As Italy construes her obligations it is said to extend merely to preventing Italians from exporting copper to the belligerents. From reports received, it is apparent that there is an unprecedented demand for copper in Europe. England placed it on the contraband list because of the variety of its uses in the manufacture of munitions of war. The result of the British ruling on the Italian view toward copper will be, in the opinion of U.S. officials, to detain all vessels at Gibraltar, where cargoes of copper are not consigned to a specific consignee in a neutral country. All copper which was shipped before the product was put on the contraband list will be paid for by the British Government, wherever seized.

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Revival in Mining is Promised.

One of our New York correspondents indicates to us the impression that 1915 is to be " a good mining year," says *Mining Science*. This is an opinion which is shared by careful observers in the west. It is true that the metals have been suffering from a bad market, but the demand for gold and silver is bound to be good and the other products of the mines will not long be in the dumps. Instead of being ultimately hurtful to the mining business, the European war is having the effect of sending capital into the west. The suspension of trading in the old-line securities has had a depressing influence upon the minds of many who are accustomed to dealing in Wall Street. These may be counted upon to give ear to good mining propositions. That men of means are keen for investment in good mining ventures is indicated by the experience in several new western camps, where the efforts of property holders are having success and the reports of exceptional discoveries are attracting prospectors and buyers from all directions. The activity of the camp-follower is a first rate symptom of good times in mining.

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The Business Outlook.

Business on the Rand is steadily returning to the normal. From Great Britain, a correspondent writes:—"As time goes on there is increasing evidence of the fact that we are in the midst of a big buying movement, with every prospect of an increased expansion in the near future. This movement, which commenced about three weeks ago, seemed at first to indicate that business was becoming more accustomed to war conditions, and consequently more settled, and that many were about to replenish their exhausted stocks, while the placing of a large number of new vessels on the Clyde gave an additional impetus to trade in general. It is now realised, however, that recently there has been an enormous amount of buying, which, beginning with home work, has spread into foreign channels, where clients, perceiving the upward trend of prices, have hastened to cover, and this has brought out new business which otherwise would not probably have been heard of for some time. Some markets, of course, are not yet participating to any extent in this buying movement. This is largely due to financial causes, money being a pretty scarce commodity since the war began. Of course, in the present expansion of trade there is room for all, but in the meantime Britain and America are the manufacturers of the world, and are likely to remain in this position for some time to come. The markets chiefly affected by the present movement are the iron and steel, pig iron, pig iron warrant, and manufactured iron and steel. These markets have weakened up considerably and good contracts are being fixed up, principally on home account, and quotations are very firm. There is, no doubt, at present a good deal of speculative buying, but, on the other hand, there is a healthy undertone, and it is the general opinion that the home markets will be busy for months to come."

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British Steel and American Competition.

The race for supremacy in the iron, steel and engineering export trade, which has for many years been between Britain and Germany, is now likely to be between Britain and America. The rapid growth of German iron and steel exports—a growth from less than 1,000,000 tons to more than 6,000,000 a year in the last fifteen years—has been largely due to the organised export bounty and credit system adopted by the Germans, and this system is pretty sure to remain broken long after the war is concluded, besides which German goods will suffer something like a world-wide boycott. German competition is bound to be crippled, if not killed. But the world's appetite for iron and steel goods will remain healthy. Roughly, there is a world's export trade in iron and steel aggregating 18,000,000 tons a year, valued at more than £200,000,000, besides machinery valued at about another £120,000,000. Of the total, Germany prior to the war was taking one-third, Britain was taking rather less than another third, while all the other countries, including the vast United States, were left to divide the remainder. In round figures, Germany was exporting 6,000,000 tons of iron and steel annually; Britain, 5,000,000 tons; and America, 2,000,000 tons. It is certain as anything in the future can be, that the bulk of that 6,000,000 tons of trade hitherto done by the German will now be diverted to and divided between British and American manufacturers, for the United Kingdom and the United States are the only two countries in a position to take any large proportions of the business that will be lost by continental makers.

TOPICS OF THE WEEK.

THE WASTE OF NATIVE LABOUR.

The native labour complements of the mines have lately engaged increased attention, and at the meeting of the S.A. Institution of Engineers the other night Mr. R. C. Warriner, General Manager and Consulting Engineer of the Crown Mines, initiated a discussion on a native labour question of extraordinary economic importance to the Rand. Not only did the discussion centre in a question of outstanding importance for the mining industry, but added interest was lent by the fact that some half-a-dozen of the leading engineers of the Rand took advantage of the occasion to express their views with a vigour and a candour that would have confounded the cynics and doubting apostles of free speech on these fields. Mr. Warriner's text was simply the long-standing scandal involved in the fact that Rand mine managers are unable to obtain from the native miner a fair day's work for a fair day's pay. His indictment of the present system was clear-cut and severe; and most of our readers are already only too familiar with the details of the anomaly. Put very briefly, Mr. Warriner's case is this: Work done by the native underground on the Rand bears no reasonable proportion, all circumstances considered, to the work he does on the surface. Heaven knows, the effort put forth by the surface boy on the mines is nothing to boast about, but, bad as it is, it puts completely in the shade the average effort exerted underground. In shovelling and tramming, for instance, where some twenty tons per boy may be credited to the native on surface work, not quite two and a half tons represents the average underground. This, Mr. Warriner submits, making all allowance for the more onerous conditions underground, shows that there is something radically wrong with the system. Professor Lawn, it may be noted, blames the bad roads in the mines as a contributory factor, and points to the much greater shovelling and tramming efficiency of "boys" in the collieries. Classifying work underground as (a) shovelling and tramming, (b) machine drilling, and (c) hand-drilling, Mr. Warriner proceeds to indicate the gulf between actual and possible results. In regard to (a) shovelling and tramming, Mr. Warriner reviews the disappointing record of failures to devise a wage scheme that would secure the maximum efficiency. He sets out very clearly the three main reasons why this department found it particularly difficult—indeed, impossible—to employ the stimulus of a satisfactory system. These difficulties mainly centre in the inability to measure individual effort. Passing to (b) machine drilling, Mr. Warriner indicates the managerial inability to overcome the disfavour with which the native regards any excess of zeal that might prompt a boy to overstep the usual footage. In regard to (c) hammer-drilling, the existing piecework system, on the framing of which the best brains of the industry have lavished their study and attention, with its fixed minimum and maximum, Mr. Warriner condemns as failing to secure its main object—the native hand drillers' maximum effort. That a fault of the system is this fixed limit to earnings seems to be largely held. Mr. Buckle, in his famous report, says so, we believe, and many engineers agree with him. As Mr. Izod points out, the piecework rate ought to be limited and fixed, but not the possible earnings. Professor Lawn, on the other hand, vigorously defends the present system, and his views doubtless are shared by the Committee of Consulting Engineers of which, of course, he is a member. So much, however, for Mr. Warriner's indictment, the main points of which we have very imperfectly outlined. In effect, he says the era of persuasion by brute force having passed, we must find some new incentive to native effort. Professor Lawn suggests "moral pressure" without being very convincing. Mr. Warriner's peroration included a plea for scientific study of the problem and an almost pathetic appeal to Rand engineers to set themselves seriously to the task of its solution. Now, to the stranger or outside critic it may seem an extraordinary confession of failure and counsel of incompetence that our leading mine managers should after all these years of Rand mining come forward with such an admission of inability to solve the first problem of mine management, namely, the securing of maximum efficiency from the available labour. Indeed, we may say at once that not only is the system described by Mr. Warriner wrong fundamentally, but there is something fundamentally wrong with a state of affairs which not only permits but imposes such a wasteful and extravagant system upon an industry. And when, as in the present case, that industry happens to be the basic industry of the country those conditions cannot be too strongly condemned. As a fact, we suspect that when Mr. Warriner, in tones of well simulated humility, begged for guidance and light from his fellow-engineers on this root-problem of the Rand, he shrewdly kept the short answer and obvious solution to himself, smiling inwardly the while at the well-meaning but wide-of-the-mark suggestions that fell in such profusion from the subsequent speakers. The truth, of course, is that the restrictions colloquially and collectively known as "the colour bar," are at the root of the whole trouble. All the excellent suggestions and ideas advanced by contributors to the debate, who forgot or ignored this cardinal fact of the matter, were simply beside the point. Mr. Warriner, as far as we could see, did not once allude to the matter in the course of his address, but he is too keen a thinker to have overlooked it altogether. We are even inclined to believe that the raising of the question in the innocent form adopted by Mr. Warriner was purposely designed to bring the truth home by first provoking people to think, and then by such thought forcing them to realise each one for himself the utter hopelessness of trying to improve the efficiency of the native labourer under existing conditions. If our reading be correct, Mr. Warriner is to be congratulated on the success of his stratagem. Unfortunately for the element of surprise, which he may have intended to import into his final reply—which is bound to be preceded, doubtless, by a protracted discussion—Mr. Way, with his wonted "quickness in the uptake," promptly put his finger on the crux of the problem. Until the native worker underground is rewarded according to the latest and best method of payment evolved by efficiency experts, namely, by piecework at a fair and fixed rate, without any limitation of earnings, and irrespective of considerations of colour (*i.e.*, is paid as a contractor by fathomage), Mr. Warriner's problem will remain unsolved; and that, as our Cornish friends say, "is all there is to it."

RAND VALUES IN DEPTH.

THE Chemical, Metallurgical and Mining Society of South Africa is taking the first opportunity of discussing Mr. T. A. Rickard's valuable paper on "The Persistence of Ore in Depth." Though the paper was read originally before the Institution of Mining and Metallurgy in London, in order to promote discussion it is to be taken as read likewise before the Rand Society. We print this week a further contribution to the discussion in London, and several other interesting contributions may be expected. Mr. H. F. Marriott, for instance, has not yet come into the arena. Perhaps the most recent contribution to the subject on the Rand was made at the last annual meeting of the Rand Mines, Ltd. Mr. Schumacher, the Chairman, in discussing the statement by Mr. H. H. Webb that "There can be no doubt that there is a gradual falling-off in the average values over large areas of the ore developed as deeper sections of the Rand are opened up," showed that this was true only in a limited degree. It did not apply to the whole of the Witwatersrand, where in many large areas little or no impoverishment had so far taken place. This was confirmed by the developments in the majority of the mines of the group, which extend from the Durban Deep on the west to the Modderfontein district on the east. On the Far Eastern Rand, where the reef dips at a comparatively flat angle, they were developing at the New Modderfontein ore of high grade at the circular shaft, where the reef was 6,500 feet from the outcrop, and, as was well known, ore of excellent grade had been encountered still further to the south in the Modderfontein Deep Levels and in the Government Gold Mining Areas (Modderfontein) Consolidated; also in the Brakpan Mines, where the remotest workings were situated approximately 20,000 feet from the outcrop measured on the dip of the reef. "The point that I wish to make clear," said Mr. Schumacher, "is that whereas the ore becomes poor in certain areas of the Witwatersrand as depth is attained, there are yet no indications of a similar occurrence in other extensive localities, and fortunately the majority of our mines are situated in districts where no appreciable impoverishment has taken place in depth during recent years."

"EFFICIENCY ENGINEERING" FOR THE RAND.

PONDEROUS works on "efficiency engineering" have lately crowded the shelves of the technical libraries, and lengthy articles on the subject have filled the scientific papers overseas, but the Rand has hitherto remained unimpressed. Some engineers have confessed that they believed the thing was overdone and being made into a fetish. At the last meeting of the South African Institution of Engineers, however, a valuable tribute was paid to the movement by Mr. E. G. Izod, Consulting Mechanical and Electrical Engineer to the Rand Mines, Ltd.; and the tribute contained testimony so direct and sincere that we may now expect the Rand to begin to "take notice" of the promise and performance of this new department of engineering activity. As a fact, the excellent work in connection with rock-drill economics achieved last year by Messrs. Izod and Calder may be credited to the movement, and a better beginning or more effective introduction could hardly have been made. Mr. Izod's remarks at the meeting of the Institution of Engineers were evoked by that singularly provocative topic, native labour efficiency, introduced by Mr. Warriner, and certainly not the least valuable of the ideas elicited was Mr. Izod's eloquent advocacy of the adoption of efficiency engineering principles on the Rand. In an article in these columns last May, before the shadow of war had fallen on the land, the appalling decrease in white efficiency on the mines and the correlated stagnation of black, were described and vouched for by the quotation of mine managers' expressed opinions. Since then there is reason to believe there has been no improvement in this direction, the tendency, if anything, being on the down grade. Mr. Izod's suggestions, therefore, come at an opportune moment. Speakers at the meeting, their words backed by the weight and emphasis allocated to the position of consulting engineer, made no secret of their dissatisfaction with some of the accepted tenets of the mine resident engineer's belief. For readiness to perceive and enterprise to adopt, the best and latest in every type of mine machinery one consulting engineer gave full credit to the average resident engineer on the Rand, but in that eternal and unrelaxing vigilance in regard to labour which is the price of true and unfailing economy, we are told he is deficient and prone to regard the number of employees under him as the measure and criterion of his own importance and ability. Unfortunately, there was no mine resident engineer present at the meeting in question to give us the other side of the story, and so this imputation of extravagance in regard to labour, white and black, under the control of the mine resident engineer went uncontradicted. The remedy for this and similar failings is, of course, as Mr. Izod pointed out, the introduction of "efficiency engineering," which connotes the study of labour economics with the object of securing the maximum result from the labour employed. The existing wage payment system on the Rand he denounced as wholly wrong and unscientific, and he mentioned that engineers in Europe refused to believe that it could obtain here. The resident engineer, of course, cannot be blamed for the failure to stimulate the native labourer, above and below ground—but particularly below ground—to put forth his best efforts. That, as we show elsewhere, is a handicap imposed upon the mining industry by the legal restrictions known as "the colour bar." But because the resident engineer perceives that an immoral law stands between him and the full and free exercise of his organising talents, he must not forego all initiative in economising. There may not be the same scope on the Rand for efficiency engineering as there is in industries elsewhere, but still there is scope. One scandal, Mr. Izod declared, must be put a stop to here, as a condition precedent to the adoption of any scientific wage system. Competition among employers for good men must be stopped, and the practice penalized heavily as is done by the Employers Federation in Great Britain. It will be seen that Mr. Izod, backed by Mr. Warriner, has made most useful suggestions, and we shall be surprised if more is not shortly heard of them.

BIG BY-PRODUCTS INDUSTRY PROJECTED IN THE UNION.

Natal Ammonium Company Erecting Extensive Works—Cheap Tar, Fertilisers and Benzol for South Africa.

THE Natal Ammonium Company, Ltd., which was floated a few years ago by Mr. W. A. Harper, with Lord Selborne as Chairman, and Messrs. Brunner, Mond & Co. as backers, is nearing the producing stage. The field of operations covers a large coal-bearing area in the Vryheid district of Natal, and, as the name of the company connotes, the production of coal by-products, such as tar, sulphate of ammonia, and benzol will be the main activities. Adequate working capital is now in hand to bring the works up to the producing stage, and a valuable new South African industry is thus about to be initiated. It may usefully be recalled here that no other known substance yields so great a variety of products as coal, but these products must be secured by means of destructive distillation. Originally the distillation of coal was practised about 100 years ago to provide gas for illumination and coke for metallurgical processes. It has been about 80 years since coke was first used in large quantities as a metallurgical fuel. Subsequent research has revealed the valuable possibilities of the other products. This subject of coal distillation is treated in a comprehensive and entertaining way by F. E. Lucas in a paper read at the annual meeting of the Mining Society of Nova Scotia. This contribution is published in the November *Bulletin* of the Canadian Mining Institute. In view of the interest in chemical manufactures which has been excited by the suspension of German trade, the alarm that has been felt concerning the supplies of coal tar products, cyanide and other commodities, and the prospect of Natal now entering the field, Mr. Lucas' references to this subject should be of timely value. What he has to say of gas and coke production is omitted. The author says:—

> Tar is of itself such a complex substance and has so many by-products which may be obtained by further distillation, that it would be almost impossible to enumerate them, but the most commonly known of these products may be mentioned, viz., pitch, which is the hard residue after the volatile constituents have been distilled off and creosote and other oils. I do not know that there is any unalterable standard or analysis to which creosote oil must conform, but the different oils extracted from the tar are many, and from these in turn may be distilled other products down to drugs and perfumes. The value of creosote oil as a wood preservative is so well known that I need not dwell at length on it except to say that since the price of lumber for railroad ties, pit props, bridge timber, etc., has practically doubled in the past 15 years and that creosoted timber will last many times longer than the ordinary timber, it seems as if it would be profitable to have a more general use of preserved timber in such work. The lighter oils derived from the distillation of tar are used as solvents for rubber, and fuel for internal combustion engines as well as providing the base for many of the finer products before mentioned. The main use for the pitch at present manufactured is as a binder for coal briquettes. The briquetting industry has grown to very large proportions in Europe, and in recent years has received a good start in this country: several plants having recently been constructed in Cape Breton alone. There is no doubt that this industry will grow quite as fast as the market can supply it with pitch, for the advantage of burning briquettes instead of fine coal has been so conclusively proven that it is likely to be only a question of time until the demand will be such that colliery owners will be forced to briquette the fine coal which may not be used for coking. Pitch is also used in considerable quantities for roofing as well as a substitute for asphalt in road making. It is also used as the base of paints, particularly for covering iron work. The undistilled tar may also be used for various purposes, although it is better to have it heated long enough to expel all water. A large quantity is used in the preparation of paper and felt roofing. It has also been proven that tar may be used in the Diesel engine with very great success. It is also used as fuel under boilers and in various kinds of heating furnaces. One purpose for which tar is often used, and it might be well if such use was more extended, is coating roads. After the road has been built and properly shaped up it is sprayed with tar. A clay road well rounded and ditched and sprayed with tar is not only dustless in dry weather, but mudless in wet weather, and the cost of applying the tar is very small when compared with the improved state of the roads so treated. Ammonia may be recovered from the gas in several forms, such as concentrated liquor for refrigeration purposes, ammonium chloride and ammonium sulphate, but in general practice the bulk of it is recovered in the latter form, the ammonia gases being either directly absorbed by a dilute sulphuric acid bath or first absorbed by water, which is in turn distilled to give off the ammonia for absorption by the acid. The principal use for ammonia sulphate is a fertilizer. Together with Chile nitrate of soda they form practically the available source of nitrogenous fertilizer, and the market for sulphate of ammonia for this purpose is like that for all artificial fertilizers, widening each year. The recovery of benzol from the gas is becoming more imperative each year as the number of internal combustion engines increases. The bulk of the world's production at present is used in automobile engines. Those of you who are fortunate, or unfortunate, enough to own automobiles know how the price of gasoline has risen. Benzol is not only a substitute for, but it is better than gasoline. Repeated tests have proven that a given quantity gives from 15 to 20 per cent. greater mileage than gasoline. A considerable quantity of benzol is also used by retort gas plants for enriching their gas and bringing it up to the required standard of candle power. More of it with zylol and toluol, recovered at the same time, is used by manufacturers of rubber as a solvent. Most of the coke oven plants of Europe recover the benzol from the gas, and I do not think it will be long before every coke oven plant will recover this product, except in such cases where the gas is used for illuminating purposes and a high candle power standard has to be maintained. The cyanides may also be recovered by a fairly simple process, but hitherto the market for cyanide compounds has not warranted the installation of many plants for their recovery. However, there is a further process now being tested with every prospect of success, which aims to recover the cyanides and then convert their nitrogen into ammonia, which will then be recovered in the usual form as sulphate. If it is necessary to purify the gas from its sulphur content before using it, the sulphur may be saved as a further by-product and used for making the sulphuric acid necessary for the recovery of the ammonia as sulphate. In this process the gas is passed through boxes containing layer of bog ore which retains the sulphur. The ore layers are changed from time to time, the foul ore lying exposed to the air for a time, and it can then be used over again. This may be kept up until the ore will contain up to 45 to 50 per cent. of metallic sulphur, making a very valuable as well as a very easily worked sulphur ore.

Swaziland Corporation.

The report of the Swaziland Corporation, Ltd., for the year ended 30th September, 1914, to be presented at the meeting on the 30th inst., shows a debit balance of £2,790. Instructions have been given to the manager to endeavour to lease some of the properties on tribute, but the directors fear that until matters in South Africa become more normal little success can be looked for in this direction. On the other hand, the directors would only consent to the Ivanhoe mine being leased to a very substantial tributor, who would undertake to carry out a considerable amount of sound development work. The company also lost on its mining licences, the income under this head being only £75, or nearly £100 less than twelve months earlier. For the year the loss was £2,790, raising the total to £15,881. Mining operations have ceased, as there are no funds to carry on further development.

Johannesburg Gold Fields.

The report of the Johannesburg Gold Fields, Ltd.—the London company interested in the Cinderella—covers the year ended 30th September, 1914, and states that the gross revenue from dividends and interest, rents and transfer fees amounted to £1,299, which, after deducting therefrom the expenditure, amounting to £789, leaves a net profit for the twelve months of £3,510, as compared with £3,365 for the previous year. An increase of £3,510 is shown in the cash assets. No change has been made in the company's investments, and the figure at which they appear in the balance sheet remains unaltered from that shown in last year's accounts. A further decrease, however, of £4,848 has to be recorded in their valuation, which is taken at the last available making-up prices prior to the war—namely, those of the end-July settlement.

PRESENT POSITION OF TANGANYIKA CONCESSIONS.

Payment of Debenture Interest Delayed—Meeting Convened—Mining Activity of the Union Miniere.

THE directors of Tanganyika Concessions announce that the company is for the time being unable to pay the debenture interest coupon due on 1st anuary. Arrangements had been made with the Société Générale de Belgique in Brussels to provide the amount required, but in consequence of the war and the occupation of Brussels by the German troops the Société Générale is at present unable to remit any funds to this country. A second circular convened a general meeting of the holders of the series of £2,600,000 first mortgage debentures for 2nd February, for the purpose of considering and, if thought fit, of passing the subjoined extraordinary resolution:—

> That the payment of all interest occuring due during the continuance of the present European war upon the outstanding Debentures of the series of £2,600,000 Debentures of the Tanganyika Concessions, Ltd., secured by trust deeds, dated 22nd November, 1906, and 13th June, 1907, respectively, shall be postponed and be deemed to be due and payable on the expiration of six months after the conclusion of the present war, instead of on the respective days on which such payments originally became due, and that the rights of the Debenture holders against the company and its property be modified and dealt with accordingly.

The secretary adds that it is important that debenture holders should either attend the meeting or forward proxies, as the presence in person or by proxy of over one-half of the debenture holders in value is necessary to form a quorum. In a third circular some information is given regarding the position of the Union Minière. The secretary writes:—" Previous to the outbreak of war, as stated in Mr. Williams' speech at the meeting of the shareholders of Tanganyika Concessions, Ltd., on 22nd July last, the estimated production of copper by the Union Minière du Haut Katanga for 1914 was 12,000 tons; for 1915, 25,000 tons, and for 1916, 40,000 tons. After the occupation of Brussels by the Germans, part of the Union Minière executive staff, including Mr. Velge, the secretary of that company, were transferred from Brussels to the offices of the Tanganyika Concessions, Ltd., London, where legally constituted board meetings are now regularly held in conformity with Article 16 of the Artices of Association of the Union Minière du Haut Katanga. The company's smelting operations in Katanga have been kept running without interruption, although copper fell rapidly from £60 to £48 per ton, but has risen since, as will have been seen, to over £56 per ton. During the period that has elapsed since the war broke out, and although considerable difficulties have been caused directly by the war, two furnaces have been kept running, producing 3,730 tons of copper up to the end of November. The third furnace was blown in at the beginning of December in order to increase the output of copper, and, in view of the rising price of the metal, it is estimated that the total production for this year will therefore not be far short of the 12,000 tons anticipated in Mr. Williams' speech to the shareholders referred to above. The copper produced from the beginning of the year up to the commencement of the war was realised at a price which shows a profit of approximately £20 per ton over the cost delivered in England. In spite of the adverse conditions affecting the metal market since the beginning of the war, the copper produced and landed in England since then has been sold at a price which shows a profit of over £10 per ton over the cost delivered in London. At the present price of copper a considerable increase in this profit will be secured, and as the price of copper is improving the company is now considering the immediate erection of two further blast furnaces which have already arrived at Beira, and it is hoped that the company will be able to erect these within a short period."

MINING IN THE KLERKSDORP DISTRICT.

A Review of Progress—Mining Last Year—Gold and Diamonds.

THE work of the gold mining industry in this district has not made any forward movement, but the production of gold by the Warren Hill, Quest and Machavie gold mines has progressed steadily. Mr. J. T. Milligan, so well known for his association with the Eastleigh and West Bonanza mines, has taken command at the Machavie, and considerable improvements have been made at this property. The output from the district for the year has been as follows:—

	Tons.	Ozs.	Value.
January	12,984	3,258	£13,838
February	12,516	2,974	12,634
March	13,033	3,228	13,713
April	13,053	2,939	12,484
May	13,429	3,212	13,611
June	13,001	2,798	11,888
July	14,003	3,085	13,106
August	13,405	3,058	12,991
September	12,304	2,904	12,336
October	13,004	3,531	14,998
November	11,936	3,388	14,392
*December	12,000	3,400	14,500
	154,778	37,775	£160,524

*Approximate.

The district's output since 1903 has been as follows.

Year.	Ozs.	Value.	Year.	Ozs.	Value.
1903	1,377	£5,743	1909	17,[illegible]	£72,135
1904	2,121	8,484	1910	16,505	70,559
1905	14,240	59,584	1911	36,7[illegible]	[illegible]
1906	11,061	41,321	1912	31,716	134,713
1907	9,631	31,536	1913	33,250	[illegible]
1908	12,559	50,636	1914	37,775	160,524

The Afrikander Company has undergone reconstruction, the capital having been reduced from £280,000 to £44,800, and then increased to £89,600 by the issue of 44,800 £1 shares at par. This working capital liquidates the company's liabilities and leaves a balance of about £5,000, which will pay present working expenses for about a year.

The Machavie Gold Mining Company held their annual meeting in March, at which it was shown that there had been difficulties with the machinery, and the cyanide extraction had not been satisfactory. Mining development had resulted in 40,474 tons ore reserves, valued at 8·7 dwts., over a stoping width of 49 inches, and 8,484 tons of partly developed ore of a value of 6 dwts. over a width of 37 inches. A profit of about £5,000 had been made, but a more vigorous policy of development had been initiated and better results were confidently anticipated.

DIAMOND DIGGING.

This has languished considerably owing to the strike, a fall in the price of diamonds, and the rebellion, and is now at its lowest ebb, our local diggings being practically deserted. The monthly returns from the South Western Transvaal have been as follows:—

	Carats.	Value.
January	3,064	£12,348
February	3,838	16,157
March	3,865	18,159
April	4,196	18,415
May	4,226	18,739
June	3,549	15,085
July	4,696	19,231
August	2,227	6,625
September	2,104	6,653
October	2,068	5,389
November	833	1,949
*December	800	1,800
	35,516	£140,861

*Approximate.

The yield from the farm Goedgenoeg, on which are situated the two diggings known as Eastleigh and Goedgenoeg, has resulted as follows: January, 243 carats, value £913; February, 222 carats, value £874; March, 261 carats, value, £1,345; April, 302 carats, value £1,399; May, 301 carats, value £1,533; June, 234 carats, value £1,086; July, 287 carats, value £1,038; August, 134 carats, value £215; September, 37 carats, value £144; October, 23 carats, value £158; November, 43 carats, value £212. The total for the eleven months amounts to 2,087 carats, value £8,967; adding, say, amounts equal to the November output for December, and the year's total will be 2,130 carats, value £9,079.

The district output for the past three years has been as follows:—

	Carats.	Value.
1911	37,861	£198,854
1912	79,709	386,668
1913	81,943	422,616

—*Klerksdorp Record.*

ANNUAL REPORT OF THE S.A. INSTITUTE OF ELECTRICAL ENGINEERS.

Flourishing Finances and Membership Roll—The Work of the Year Reviewed—Plea for Increased Interest.

At the annual meeting of the South African Institution of Electrical Engineers this week, the following report on the work of the past year was submitted:—

Finance.—The income for the year has been £697 1s., whilst the expenditure has been £425 15s. 11d. After setting aside an amount of £133 12s. 9d. (which figure is explained below) there is a nett surplus for the year of £136 12s. 4d. brought down to the balance sheet. The above-mentioned figure of £133 12s. 9d. is made up as follows:—(1) £33 12s. 9d. written off for bad debts incurred in 1913 in excess of what was provided for in that year's accounts; (2) £61 13s. 9d. for bad debts written off for 1914 in respect of those whose membership lapsed in accordance with Rule No. 22; (3) a provisional sum of £38 6s. 3d. to provide for possible bad debts incurred in 1914. This is considered by your Council an ample provision in view of the amount written off under item (2). The necessity for making such an ample provision is much to be regretted, but your Council considers that it is a sound policy to write down the value of outstanding subscriptions, as many of the members in these times of stress and strain are overwhelmed by circumstances. The credit balance at the end of the year amounted to £590 5s. 2d., as against £453 12s. 10d. a year ago. The amount on fixed deposit has been increased to £300. A sum amounting to £170 7s., also earning interest, is in the Post Office Savings Bank, whence it can be drawn as required. The financial position can be considered as satisfactory, but, in the opinion of your Council, it is advisable to conserve the resources of the Institute to provide for the extending scope of its work. Membership.—The following table shows the membership at the end of the year:—

	M.	A.M.	A.	S.	Total.
At 31st December, 1913	91	119	33	35	278
Elected or admitted during 1914	18	16	2	7	43
	109	135	35	42	321
Resigned or stuck off	21	33	15	16	85*
	88	102	20	26	236

Students' Section.—This section was reorganised in April, and monthly meetings were arranged. Mr. Percy Perrow (student) was elected chairman, and Mr. E. M. Dall (now associate member), hon. secretary. Three very successful meetings were held, which were also attended by a number of electrical apprentices in the district. This branch of the Institute shows great possibilities, and your Council gave special attention to the matter, but on the outbreak of war so many of our student members went on active service that it become necessary to suspend the meetings until further notice. Mr. Victor Rose is now the hon. secretary of this section. New Patents Bill.—A joint meeting of representatives of the various technical societies was held in May last, at the instance of the Chemical, Metallurgical and Mining Society, to consider what recommendations should be made to Government in reference to some of the provisions of the new Patents Bill. It is uncertain when the Bill will be proceeded with; but its bearing on our interests should not be lost sight of when it is next before Parliament. Development of Resources of the Union.—A committee was formed during the year for the following purposes: The collection and consideration of data relating to the undeveloped resources of the country, with a view to stimulating and assisting electrical enterprise in the development of such resources. A certain amount of work has been done as a preliminary to the investigations that will be necessary. A deputation from your Council waited on the Minister for Mines and Industries, who assured it of his interest and sympathy with the objects in view. The Government has kindly promised to grant every faciilty to the Institute to assist in this work. Your Council hopes next year to be able to report substantial progress. Ordinary General Meetings.—The attendance at the monthly meetings, in view of the extraordinary conditions experienced throughout the year, must be considered satisfactory, the average having been 35 per meeting. Owing to the proclamation of Martial Law, following the declaration by the miners of a general strike in sympathy with the strike of railwaymen, no meeting was held in January. One of the outstanding features of the meetings has been the keen interest taken in the discussion of the various technical questions that have appeared on the agendas. Excursions.—An interesting an enjoyable visit was paid in April to the telephone and telegraph departments of the General Post Office, Johannesburg, where the latest developments, including a field wireless installation, were exhibited to a large and appreciative attendance of members, who were in many cases accompanied by lady friends. In July a number of members proceeded to Kimberley in company with the Chemical, Metallurgical and Mining Society at the invitation of De Beers Consolidated Mines, Limited, to attend the annual meetings of the South African Association for the Advance of Science and the Medical Congress. A paper was presented to the South African Association, entitled "A Few Statistics Regarding the Use of Electricity on the Witwatersrand." This was printed in the December "Journal." The paper is of special interest, and has been widely circulated and commented upon. The visit lasted a week, and the pleasure of visiting members was much enhanced by the hospitality of De Beers Company and the Kimberley Municipal Council. In November, at the invitation of the Victoria Falls and Transvaal Power Company, Limited, and the Rand Mines Power Supply Company, Limited, an enjoyable visit was paid to the Rosherville Power Station by about one hundred members and friends professionally interested. The social value of these visits is not the least of the benefits derived by members, and our thanks are due in each case to our hosts for their hospitality. Annual Dinner.—In the ordinary course this function would have been held early in December, but owing to the unsettled conditions already referred to, it was decided to postpone it sine die. School of Mines and Technology Evening Classes Examinations.—The prizes offered by the Institute have been awarded as follows:—Electrotechnics, Stage III., bronze medal, no award; Electrotechnics, Stage II., £2 2s., Mr. T. S. Lewis; Electrotechnics, Stage I., £1 1s., Mr. J. O. Pentz; Electricity, Stage I., £1 11s. 6d., Mr. M. Witkin. Council Meetings.—Twelve meetings of the Council took place during the year, in addition to a large number of meetings of the various committees. The average attendance was 10 members per Council meeting. Concluding Remarks.—Taking into consideration the unparalleled times through which we are passing: the strike in 1913; the second strike in January last year; the conditions set up by the war and the late rebellion, your Council feels that there is much cause for congratulation in the position of the Institute. It is in times such as these that scientific and technical bodies are liable to suffer through lack of interest and support, and it therefore behoves members individually to make special efforts in the coming year to support the Institute, not only by the prompt payment of subscriptions, but by attending the meetings, by joining in the discussions, and by making every endeavour to increase the membership.

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* On reference to the Report for the year 1913 (see part 1, vol. v.) it will be seen that the total number of members who resigned or were struck off for 1913 was only 19, as against 85 for the year 1914 shown above. The explanation of this large increase is that as a result of new rule No. 22 it became necessary in April, 1914 to write off 36 members in respect of 1912 and 1913. The true comparison, therefore, is: Struck off for 1912 and 1913, 36 (in addition to 19 resigned or struck off according to 1913 report); resigned or struck off for 1914, 49. Total, 85. From the above it will be seen that notwithstanding the unusual conditions obtaining during the year, the membership has been well maintained.

Bantjes Consolidated Mines.

The secretaries write:—We have to inform you that the following has been cabled to London for publication: "Shaft repairs still advancing slowly, but renewed heavy rains are exercising detrimental effect on progress. Pumps holding the water about 12th level in spite of greatly increased volume entering mine owing to wet weather. Tonnage being crushed from mine equals about 2,000 tons per week. Impossible estimate at present when full hoisting operations will be resumed but must certainly anticipate losses for January and February. Development work almost at a standstill and stoping confined to areas feeding east shaft

Glynn's Lydenburg.

The following are the particulars of this company's output for the month of December, 1914:—Tons crushed, 4,100 tons, yielding 1,521 fine ozs.; estimated value of month's output, £6,343; estimated profit for the month, £[illegible]137. The reduced profit is chiefly due to decreased recovery.

Village Deep.

The Village Deep, in the quarter ended the 30th of September, made a working profit of £33,573, equal to 10s. 8d. per ton milled. The total expenditure amounted to £130,141 or 17s. 1d. per ton, and the revenue from gold [illegible]

THE NEW UNION WORKMEN'S COMPENSATION ACT.

First Month of Operation—Works of Reference—Insurance Questions—Are Private Company Premiums Too High?—Value of Employers' Mutual Indemnity Societies—A State Insurance Proposal.

THE new Workmen's Compensation Act of the Union came into operation on January 1, and is now working smoothly. The mining industry of the Rand has its own Mutual Assurance Society, to which almost all the mines belong, and the Act means no change of procedure for the industry. With other employers throughout the Union, of course, the case is different; and we note that various insurance societies are carrying on a campaign to enlighten employers in regard to their liabilities, and to emphasise the wisdom of insurance, if only "to save peace of mind," in view of the financial responsibilities under the Act. From the *Transvaal Leader* we have received a clear reprint of the Act, and the Regulations framed thereunder, with a comprehensive index to admit of easy reference. The work is published at half-a-crown, and will be found useful by many—servants as well as masters—interested in its provisions. Lawyers and others requiring a more comprehensive work are referred to Messrs. Barrys' book, of which, however, we are unable to speak, as we have not yet seen a copy. From the working of similar legal provisions in the United Kingdom much may be learned. In this connection it is noteworthy that it was announced a few months ago that the Imperial Government had decided to appoint a Committee to inquire into the working of the Workmen's Compensation Act, 1906, of the United Kingdom, and at the same time to investigate the question whether, in place of the present method of private insurance, it would not be better to introduce State insurance of employers against compensation risks of all kinds. As is generally known, the responsibilities placed upon employers under the British Act are undertaken at present by insurance companies, mutual indemnity societies formed by groups of employers, and by employers individually on their own account. Government insurance, whilst seeming to aim in the first place at the conversion of the business conducted by the companies into a State service, would presumably also cover the work carried on by the mutual societies and by individual employers. Apparently the nomination of the Committee, or the work of the Committee if it was actually appointed, has been postponed in consequence of the war. It will be serviceable to note that the number of employers—doubtless only finding occupation for comparatively few workers in each instance—who have no cases of compensation to report under the Act, now exceeds twenty-five thousand per annum. At the same time, it has to be borne in mind that the companies, mutual societies, and employers who accept their own risks have expended a considerable amount of time and money in gaining the valuable experience which they now possess of the working of the Act. In the case of the companies alone, the business did not prove to be profitable from a commercial point of view until 1912, but it may be assumed that the profit-earning position has been maintained since. This result has only been achieved by the gradual increase in the premium rates, and in the careful selection of risks, and assuming that the companies have not *voluntarily* relinquished any of the business, the effect of the advance in rates in the past few years has been of a twofold character. It is found, on the one hand—and notwithstanding the growth in the number of cases of compensation for fatal injuries and disablement, and consequently in the total expenditure incurred annually—that the amount of compensation paid by the companies is gradually declining; whilst, on the other, the payments made by mutual societies and by individual employers are constantly increasing. If, then, the companies are not abandoning any of the business willingly, it is obvious that they are losing it on account of the maintenance of premium rates, which, rightly or wrongly, employers consider too high, and which are compelling them to assume a greater measure of the risk themselves. In Great Britain the insurance companies which engage in employers' liability business are extremely careful to maintain secrecy, except to prospective clients, regarding their premium rates for particular branches of industry, each acting on the principle that the publication of figures would only be of advantage to rival insurance offices. It would appear to be conclusively shown that the higher rates charged in the past few years are inducing employers in self-defence to undertake a greater degree of risk on their own account, either individually or in groups in the form of mutual indemnity societies. Yet if it is true—as the companies claim and as is said to be proved by the returns supplied to the Board of Trade—that the compensation business was conducted at a loss for some years, they can scarcely be blamed for raising premium rates to a remunerative level, owing to the growing risks of compensation. The rapid growth of the financial charges levied by the British Act explains to a large extent the advance in the premium rates charged by the companies in recent years in the face of increasing numbers of fatalities and cases of disablement year after year, although the growing number of workers has to be taken into consideration in this connection. On the other hand, employers are fully justified in resisting any attempts to force them to pay abnormal premium rates, and it would be of value to employers in South Africa if those who have discontinued business with any of the insurance offices would furnish a comparison between the results obtained by self-insurance and the cost when their risks were insured with companies.

New Lisbon-Berlyn, Ltd.

INCREASE IN ORE RESERVES—PROPOSED REORGANISATION OF CAPITAL.

The seventh ordinary general meeting of the New Lisbon Berlyn, Ltd., was held in mail week, at Salisbury House, London Wall, E.C., Captain F. B. Lawson (chairman) presiding. The Chairman, in moving the adoption of the report, said: The accounts before you cover a period of eighteen months from October 1, 1912, to March 31, 1914. Now, the whole of the period has been occupied in prospecting the mine and carrying out experiments in the treatment of pyritic ores. In both instances have most successful results been obtained. These results are summarised in the report of Mr. H. Sharpley, which accompanies the accounts, and which is dated March 3 of this year. You will see in the directors' report that further work has been carried on since then, and Mr. Sharpley states, on August 8 last, that we had in the mine developed ore reserves of 103,013 tons, which would yield on treatment, making reasonable allowance for loss in extraction, the total sum of £167,765, with a total estimated profit of £65,404; this is allowing for working costs at 20s. per ton. The machinery which must be erected to deal with this class of ore is not expensive; the power to drive the machinery is avilable in the waterfalls on the farms at Lisbon and Berlyn, and the total cost of providing machinery, installing the power plant, and conveying the power to the mine is estimated not to exceed £25,000 or £26,000. A scheme for consolidating the finance of the company, for providing for the repayment of its indebtedness, and for equipping the mine with power plant was already under consideration when this unfortunate war broke out. It will be placed before the shareholders at the first moment it is possible to contemplate any new financial enterprise. Beyond saying this I have nothing to add to the directors' report, and I would recommend all the shareholders carefully to examine the summary of the report given by Mr. Sharpley, which shows that we have in this property of ours at Frankfort a very valuable mine developed, and only awaiting necessary equipment to repay them for the many disappointments that have been met with hitherto.

Witwatersrand Deep.

Gold to the estimated value of £169,263 11s. 8d. was won at the Witwatersrand Deep. The total expenditure came to £108,681 16s. 9d., equal to 16s. 3·72d., and the profit for the quarter to £60,581 14s. 11d., or 9s. 1·09d. per ton.

Correspondence and Discussion.

Comments on Questions Arising in Technical Practice or Suggested by Articles in the Journal—Views, Suggestions and Experiences of Readers.

Kumst Diamonds and De Beers Roodeplaat.

To the Editor, *South African Mining Journal.*

Sir,—I am a shareholder (1,000 shares) in Kumst Diamonds, Ltd., and would thank you if I could obtain any information as to how this company stands, through your valuable paper. I understand that some time ago a company called the " De Beers Roodeplaats " entered into an agreement with Kumst Diamonds, Ltd., whereby they agreed to take over the property and give three £1 fully paid up shares in their company for every five 2s. 6d. shares of the Kumst Diamonds, Ltd. I myself have made enquiries, but could not get any information, and in fact I could not locate the office of the Kumst Diamonds, Ltd., therefore I would esteem it a favour if you could assist me in obtaining the information as to how the shareholders of Kumst Diamonds, Ltd., stand. Thanking you in anticipation.—Yours, etc.,

" A. D."

Johannesburg,
14th January, 1915.

[Perhaps someone responsible or another shareholder will help to enlighten our correspondent.—Ed.]

The Care of Mine Reports.

To the Editor, *South African Mining Journal.*

Sir,—A long experience of the state into which plans and reports that are " hawked about " the mining offices of Johannesburg tempts me to draw attention to, and re-echo, the following plea addressed by a correspondent to *Mining Science*. He writes:—" The prospective renewal of activities in financing and negotiating mines, which is to be expected with the restoration of general business, makes it timely to call attention to a delicate but important matter involving the presentation of mining propositions to prospective investors which may not be fully appreciated by your readers but which is a frequent subject of unfavourable comment here. I refer to the common practice of submitting old, soiled and worn reports and maps and of using one set of papers through the season or many seasons, so that finally the whole record becomes decidedly unpresentable and disagreeable and in some cases positively unsanitary. These reports are in all respects similar to the personal business card of the man who submits a business proposition and the effect of dirty reports at the critical state of any negotiation is the same as if the man sent into an office a torn, worn and dirty card. Then dirty reports must inevitably make an unfavourable impression upon the engineer or agent who examines them, and they, too, tell, on their face the record of many previous attempts to sell or finance the property. It costs only a trifle to have clean reports. As to the subject matter and scope of the reports, that is another story, but let us have sanitary reports at least."
Yours, etc.,

" S.P.C.C.E."

Petrolex: Some Pertinent Questions.

To the Editor, *South African Mining Journal*

Sir,—The columns of the Press, during the last few days, inform us, through the medium of a " Reader " advertisement, that a company has been floated to exploit a new substitute for petrol. It is called " Petrolex," and the company is said to have a capital of £70,000, of which £35,000 is working capital. We are not told how much money is to go to the vendors. My object in writing this letter is to warn intending subscribers for, and purchasers of, shares in this company, before it is too late. I only know one of the directors, personally. I am not attacking their honesty, but I do most strongly question their intelligence in this matter, if it is to be gauged by the matter contained in the published advertisement. In the days of the South Sea Bubble, it is said that one of the companies floated, in the height of the excitement, was for a " design which will hereafter be promulgated." The detailed objects of the company which is to exploit " Petrolex " are not much more definite. The public is asked to take shares in the exploitation of a "secret formula " for the preparation of a substance which is said to be cheaper and more efficient than petrol. How can the correctness of these statements be judged by the public? How many people know the " secret "? What is the value of a " secret " known to a board of directors, any future member of which may decide, quite legally, to work it through his own agents, for his own profit? If the board do know it, what technical knowledge do they possess that enables them to judge of its value? If they do not know it, what guarantees of its value can they give the public? How can they prove to their own, or any one else's satisfaction, that the product tested was actually produced by any particular process? Would any of them, for instance, be capable of judging by inspection, whether it was ordinary petrol, artificial petrol, petrolised alcohol or methylated spirit, benzol, a mixture of petrol and ordinary paraffin, or any other inflammable hydrocarbon? Why have no patents been secured on this striking novelty? Why is no independent report on the process, by any engineer or chemist, referred to in the advertising matter? If any such report is in existence, was the author told the " secret "? If not, what is the value of his report? Should a financial fiasco come about in connection with " Petrolex," it will then be too late to ask these questions usefully. I therefore ask them now. I advise those of the public, who may be thinking of investing in the company, to refrain from doing so till my questions are answered; and I invite the assistance of the Johannesburg Press in the protection of the public.—Yours, etc.,

E. J. MOYNIHAN.

20th January, 1915.

ANSWERS TO CORRESPONDENTS.

" Dissatisfied."—The board certainly owes you an explanation, and will doubtless reply in due course to your letter.

" Critic."—Your letter is libellous.

A Safety and Sanitary League.

A Safety and Sanitary League has been organised among Joplin operators, writes a correspondent. One of its objects is to prevent accidents at the mines by improvement in equipment and by such uniform rules as will tend to educate the miners. Its prime object, however, will be to alleviate the conditions which make for the increase of miners' phthisis. The organisation, working in conjunction with the State mine inspectors, the U.S. Bureau of Mines and the Public Health Service, will try to carry out measures for the prevention of rock dust, for better ventilation, and for more sanitary conditions underground and in the change rooms. A set of rules and recommendations will be made out immediately by the committee with the advice of the inspectors, which will be put into effect at all the mines connected with the organisation. A campaign of education will be started to help the miners themselves to understand conditions and get them to assist in the measures being taken for their benefit. The campaign will also include work of getting all the mine operators into the organisation. It is believed that eventually all the good miners will want to work only for such companies as follow the recommended rules and preserve sanitary conditions, and that mines not belonging to the organisation will find it difficult to get good help or to keep a steady force.

THE PERSISTENCE OF ORE IN DEPTH DISCUSSION.

Some Critical Views—Opinions of Dr. C. G. Cullis, and Mr. McDermott.

THE following are further contributions to the discussion on Mr. Rickard's paper before the Institute of Mining and Metallurgy:—

Dr. C. G. Cullis said he had read the author's paper, and listened to the characteristic remarks with which he had introduced the subject, with pleasure and admiration. The matter was one, not only of great geological interest, but of still greater interest and importance from a practical mining point of view. So far as he was aware, the trend of opinion amongst economic geologists during the last ten years had been emphatically in favour of the view that mineral deposits did not retain their values in depth. That was the author's contention, and at first it would appear that in this matter the conclusions of the miner and the views of the geologist were in agreement. But he did not think the agreement was quite as complete as at first might appear. A discrepancy arose from the fact that the geologist and the miner did not use the term "depth" in the same sense. The former employed it in the geological sense, the latter in the much more limited mining sense, and when the author contended that mineral deposits did not retain their values in depth, he practically meant that they did not do so at depths amounting to or greatly exceeding one mile. In other words, commercial ore deposits were limited to the outermost one four thousandth part of the earth's radius, or in other words, to the uppermost one-fifteenth of the earth's crust. The question which the geologist had to ask himself was whether he could accept the principle with such a narrow restriction of the term "depth." There could be no doubt that the author's contention was valid for certain types of ore deposits which had been formed under surface conditions, such as alluvials, residual and sedimentary deposits, and those formed by the downward precolation of surface waters. From their mode of origin it followed that these were necessarily confined either to the surface or to comparatively slight depths beneath it. But there were other important types which had been formed under deep-seated conditions, such as veins filled by ascending mineral solutions, and deposits genetically connected with plutonic igneous rocks—contact and pneumatolytic deposits, and magmatic segregations. With regard to these, while geology provided evidence from which it might be inferred that even they could not extend indefinitely in depth, it did not, he thought, favour the view that they were necessarily confined to the meagre depths of the author's contention. Judged by its mode of origin, he thought the magmatic segregation was a type of ore deposit which might be expected to extend, not indefinitely, but at least to depths exceeding the present limits of mining operations. With regard to lodes of the type to which the author had confined his attention, a number of geological conditions would influence the depth to which their metalliferous minerals might continue of commercial value. One was the vertical range through which the precipitation of the ore minerals had taken place—the interval between the depth at which precipitation had begun and that at which it had ceased. In view of the slowness with which temperatures and pressures varied with ascent or descent in the earth's crust, this interval might very well be as much as 5,000 ft., or even twice that amount. Another condition was whether the existing outcrop exposed the lode near the upper limit of precipitation, or whether it had been long subject to erosion and consequently occurred deeper down, nearer the lower limit. There was also the possibility of the lode passing in depth from one formation to another, and the favourable or unfavourable effect of such a passage. He ventured to express the opinion that while there must must be a certain proportion of lodes in which these conditions of precipitation, exposure, and country, not to mention others, were such as to result in impoverishment or actual extinction of values at shallow depths, there must be others in which, the same conditions being favourable, values might be expected to continue to depths well below those at present imposed by mining practice. They had to thank the author for having brought before them an extremely important subject. It was one which was certain to give rise to a most interesting and useful discussion.

Mr. W. McDermott said that what they had heard already had been so highly interesting that upon the main subject of the paper he had nothing to add, because he thought all those who had much experience would agree that there were a painful number of instances of mines which rapidly got no better with depth. However, he thought the author's general conclusions might make some people a little more despondent than there was any necessity for: because even within the profitable depths which had been attained, of the good margin from 150 ft. to 5,000 ft.—there were plenty of opportunities for the mining engineer. It must be a great consolation also to consider what a merciful dispensation of Providence it was that the poor ends of mines were not stuck up in the air. It seemed to have been specially arranged the other way for the benefit of the profession of the mining engineer, giving an encouragement to start from the surface: and also hopefulness, so that capital was obtainable to back up hope as to persistence in depth in that particular case in which each man was personally interested. At a meeting like the present in ordinary times, he thought one might point to the fact that the extremely interesting paper before them was a warning and a danger signal to the younger mining engineers not to be led away by too much hopefulness; but in looking round he saw a marked absence of the younger faces, and this for a reason which they had good cause to accept as an excellent one. But there was one point he would like to make, in spite of the warning of Mr. Trewartha-James, and that was in connection with the definition of the word "ore." He thought it was germane to the discussion because the whole paper was a question of the persistence of ore as understood by the author. Mr. Rickard was well known as a critic and a reformer; he (Mr. McDermott) symbolically took off his hat to the author because he had taught him a number of things. If at his age he could accept points from the author in the use of language, definitions, and that sort of thing, there was every hope for believing that the younger members might get still more advantage, and therefore the work was most valuable that Mr. Rickard had done in his attempt to purify the language of engineers and to secure greater accuracy in definitions and the use of technical terms. As an instance, speaking for himself, he could say that, at least in writing, he had been cured of the use of the words "payable ore." The habits of a lifetime might force him to use them verbally, but he certainly had been cured of writing them. But Mr. Rickard, like all reformers, occasionally got intoxicated with the products of his own fermentation. In one of his fits of intemperance he had run amuck on the word "ore." He (Mr. McDermott) considered that "ore" was a useful, well understood, and law-abiding word; and that Mr. Rickard's brutal and unprovoked attack was very wrong. As far as he was concerned even dismemberment by wild horses would not make him agree to accept any such strait-laced definition as suggested by Mr. Rickard for a term which was so useful and necessary in its elastic and generally accepted meaning. The word as generally used was not subject to much abuse or to much misunderstanding. He thought that any attempt to strictly define it, to put it into a strait waistcoat, would only lead to a diminution of its usefulness, and would really serve no desirable end.

(To be continued.)

The Storage of Coal.

In view of the immense demands of industries such as gas making, etc., where one works will use from 1,000 to 2,000 tons of coal a day, the question of a proper method of storage is important. It is generally conceded that no air stacked heap—whether under cover or in the open should be piled to a great height than 20 feet. When this rule is violated, dust pockets are likely to occur, resulting in ignition or spontaneous combustion. For this reason, when 20 feet is to be the maximum height of the stack, the storage capacity is limited to about 20,000 tons per acre of ground space. By adopting the wet storage method that is, storing under water the capacity per unit of ground area can be more than doubled. It is likewise true that when submerged, coal does not vary much in temperature and does not deteriorate greatly, due to the gases being more or less confined, thus preventing general oxidation. Another consideration in wet storage is the prevention of breakage, the pulverisation being reduced by the water forming a cushion between the various lumps. Submerged storage, of course, is not without some disadvantages. The system entails a considerable initial expense, due to the necessity of constructing a substantial reinforced concrete reservoir. A further consideration is the cost of pumping machinery for emptying and filling purposes. It is furthermore a fact that coal subjected to storage is usually found to be brittle and somewhat dull in appearance. The latter effect is superficial, and on drying in the sun rapidly disappears. Probably the best method of storage is that known as the "mixed method," where a supply of coal is stacked in the open and an emergency supply is stored under water. The latter supply may stand for five or ten years, and will be found to have deteriorated to only a very slight extent. Much depends on the locality where the coal is to be stored. If the neighbourhood is is congested and the price of land high, submerged storage will afford relief by increasing the capacity per unit of ground. If the coal is to be used for gas making purposes, arrangement should be made as far as possible to set the coal aside for drying before using. This is not so essential when the fuel is used for steam raising or for firing purposes. Many engineers believe it is better to carbonise a wet coal giving a slightly increased yield of impurities, than an air stacked coal which has lost perhaps 10 per cent. of its gas making value.—*Coal Age.*

INVESTORS' DIARY.

FORTHCOMING COMPANY MEETINGS

Feb. 26.—Southern Freeholds, South Deeps; East Rietfontein Syndicate
March 26.—Jupiter G M. Co.; Simmer Deep.

Rhodesian Section.

LATEST MINING NEWS.

Lonely Output—Battlefields (Rhodesia)—Giant Mines of Rhodesia—Cam and Motor Position—Farm Lands of Rhodesia—New Rhodesia District Development Proposed Amalgamation—Toronto—New Mining Invention.

The following are the particulars of the output of gold from the Lonely Mine for December, 1914:—Mill ran 670 hours, crushed 4,500 tons; yield of fine gold, 826·461 ozs., value £3,473 19s. 3d.; slimes treated, 4,500 tons; yield of fine gold, £2,375·527 ozs., value £9,988 7s. 9d.; total recovery of fine gold, 3,201·988 ozs.; total value, £13,462 7s.; estimated profit, £6,462.

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For the year ended June 30, 1914, the revenue of the Battlefields (Rhodesia) was £1,754 and the expenses £1,852, the balance at debit of profit and loss account being increased by £97, to £24,595. The shares and debentures, which appear in the accounts at £12,612, include holdings in the Brakpan Mines, Bwana M'Kubwa Copper, New Copley Collieries, Nourse Mines, Village Deep, and Wankie Colliery. The tributors terminated their agreement on December 31, 1913, there being no prospect of any further payable ore. The directors decided to abandon all the mining claims with the exception of those upon which the machinery, etc., stands. Up to October 13, 1914, sales of plant have realised £2,647. A sale of the company's assets to the New Rhodesia District Development Company is proposed. Shareholders will receive two fully-paid shares in the New Rhodesia Company in exchange for five fully-paid shares in the Battlefields. Having regard to the potential value of some of the assets of the New Rhodesia Company the directors have no hesitation in recommending the amalgamation.

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The amount at credit of profit and loss account of the Giant Mines at June 30, 1913, was £8,485, and the net profit for the year ended June 30, 1914, was £18,055, making £26,540. The directors have transferred £20,000 to reserve account, making it £100,000, and have written off the cost of boring, £5,320, leaving £1,220 to be carried forward. For the year 123,320 tons were crushed yielding £99,577. The working profit was £34,189. Working costs for the period were 10s. 7·255d., against 13s. 3·49d. It was impossible to give any reliable figures of payable ore reserves at June 30 last, owing to numerous falls of country rock. The manager considers that he will be able to continue on the present reduced scale of monthly tonnage for some little time to come, unless any further serious falls should take place. Giant South: This mine has been dewatered, and work has now been started at the 2nd level to further confirm the values intersected in the bores. Cam-Good Shepherd option: In view of the satisfactory development work, the board, in conjunction with the London and Rhodesian Co., have agreed to purchase a half-interest in this section of the Cam and Motor Co.'s property for £50,000. At June 30 last the manager reported a tonnage of 111,858, of a gross value of £244,794.

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The accounts of the Cam and Motor Company, just issued, show that at the end of last June the amount borrowed, from the London and Rhodesian Mining and Land Company, was nearly £94,000. The directors now inform the shareholders that they have entered into arrangements for issuing £50,000 debentures, carrying interest at 7 per cent., redeemable within five years. The London and Rhodesian has agreed to subscribe for or obtain subscriptions for the whole of this amount. The same company has, on behalf of itself and the Giant Mines, made an offer of £50,000 for one-half share in the Cam and Good Shepherd properties, which offer has been accepted by the Cam and Motor board. As commission for finding subscriptions for the debentures, the London and Rhodesian has been given a call on 100,000 Cam and Motor shares at par, less 10 per cent., for a period of two years after peace is declared. As a result of these financial arrangements the liability appearing under sundry creditors in the balance sheet has been liquidated, the only liability now outstanding being the amount due to the bank in connection with the purchase of stores and additional plant. This item is being gradually reduced by monthly profits. In view of these arrangements, the directors remark:—"The company is much nearer the dividend-paying stage than would otherwise have been the case." It seems to us, however, that it is still rather early days to talk of dividends, seeing that the monthly profits being earned are anything but large, and that before the capital of £517,500 ranks for dividend provision has to be made for debenture interest and redemption. In the last financial year five monthly returns were made, and these showed a working profit of only 3s. 4d. per ton of ore crushed. The total working profit was £7,820, but the net profit was no more than £697. Working costs are stated to have averaged 26s. 3d. per ton; if administration expenses, depreciation, etc., be taken into account, the average works out at 29s. 4d. per ton. Since June the difficulty experienced in successfully treating the ore has been to a certain extent overcome, the extraction having risen from just over 60 per cent. to 73 per cent. in November, while working costs have been reduced by 2s. per ton. The ore treatment process is being modified, and the manager is stated to be of opinion that at the end of February, on the completion of the additional plant now in course of erection, still further improvement will be shown, not only in extraction, but in working costs. Then, perhaps, shareholders may begin to hope for a dividend. The ore reserves at the end of June were estimated at 978,890 tons (averaging 44s. 3·6d. per ton), as against 1,016,240 tons twelve months earlier, the small decline being attributed to the fact that a very limited amount of development work was carried out during the past year at the No. 6 level. As regards the prospects of the Motor mine, the chief of the company's properties, the general manager reports that, judging by the way the lode is now opening up in the bottom of the mine, it would appear that with further extension of the main south drive at No. 6 level a large and highly payable body of ore will eventually be opened up.

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For the twelve months ended June 30, 1914, the directors of the Farm Lands of Rhodesia report that 100,000 shares were issued, representing the purchase price for the Clare estates. The authorised debenture capital is £50,000, of which the balance of £9,600 has been issued during the year for cash. A profit has been made of £717. It has not yet been possible to employ the whole of the available working capital. In regard to tobacco a crop of 10,000 lbs. has been harvested and stored. The tobacco sales held in Salisbury on May 6 last were a failure, and the future operations of the company under this head will depend a good deal on the result of sale in London. The operations of the company during the ensuing twelve months will be concentrated entirely on the raising of cattle and the growing of mealies. During the year 6,721·30 acres of outlying estates were sold.

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An extraordinary general meeting of the New Rhodesia District Development Co., Ltd., was convened for December

30 for the purpose of considering a resolution for amalgamation with the Battlefields (Rhodesia), Ltd. The secretary of the former company, in a circular to the shareholders, states: "The authorised capital of the Battlefields (Rhodesia), Ltd., is £250,000 in shares of £1 each, of which 199,879 shares have been issued and are fully paid. The assets of the Battlefields (Rhodesia), Ltd., in addition to its cash amounting to upwards of £7,000, include share interests in the Brakpan Mines, Ltd., Bwana M'Kubwa Copper Mining Co., Ltd., New Copley Collieries, Ltd., Nourse Mines, Ltd., Village Deep, Ltd., and debentures in the Wankie Colliery Co., Ltd. An arrangement has been come to, subject to the approval of the shareholders, whereby the New Rhodesia District Development Co., Ltd., will purchase these assets and the undertaking of the Battlefields (Rhodesia), Ltd., for 53,447 fully-paid ordinary shares of £1 each of the New Rhodesia District Development Co., Ltd., this company also undertaking to discharge all the liabilities and the liquidation expenses of the vendor company. The purchase consideration provisionally agreed upon corresponds with the present estimated value of the undertaking and assets of the vendor company, and your directors have no hesitation in recommending the purchase as a reasonable and fair proposition."

* * * *

The result of the trial crushing from the Toronto mine is very satisfactory, says the Umtata paper. Owing to the heavy rains and consequent difficulty in transporting the rock to the Embeza mill, only 343 tons were treated instead of 500 which was intended. The returns from the tonnage crushed, however, is sufficient to show that the values are there right enough. The recovery over the plates was:—Gold of the value of £181 15s.; silver, £1 17s.; tailings and slimes gold, £345 9s. 1d.; silver, £2 5s. 2d.; a total of £531 6s. 3d. from 343 tons.

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The *Bulawayo Chronicle* draws attention to a new mining invention by Mr. J. Cassidy, of that town. The invention, it says, is in the form of a simple quartz mill, the motive power being aided by a flexible power cradle at its base, working on springs, and the demonstrations which have been given have satisfied those who witnessed them that the stamp is all that Mr. Cassidy claims it to be. There is nothing complicated about the stamp; it is, in fact, chiefly remarkable for its simplicity. But it is none the less effective on this account. That it is easy of erection and the fact of it entailing little cost should prove a big factor in making its use general, especially where resort has to be had to primitive means of crushing. One may gather that the invention is easy of transport by the fact that eight donkeys would be sufficient to draw the whole outfit.

State Subsidies to Mining.

In the Queensland Legislative Assembly recently, Mr. Mackay asked the Secretary for Mines the following questions, and received the replies attached thereto:—(1) What assistance was given in aid of mining, by way of subsidy, to the various goldfields of Queensland, for the year ended 30th June, 1914—(a) amount granted; (b) amount expended? Answer: "Granted during year ended 30th June, 1914—Deep-sinking, £19,920; roads and bridges and water supply, £4,708 18s. 1d.; prospecting, £1,919; total, £26,547 18s. 1d. Expended from vote, 1913-1914—Deep-sinking, £9,157 3s. 4d.; roads and bridges, etc., £3,652 2s. 5d.; prospecting, £632 6s. 3d.; total, £13,441 12s." (2) Is the balance still available for the person or company interested? Answer: "Yes." (3) Is the £16,000 now appearing on the Estimates in addition to the subsidy previously voted by Parliament? Answer: "This is now under consideration." Again, in the Queensland Legislative Assembly, on the 22nd October, Mr. Winstanley asked the Secretary for Mines the following questions, and received the answer attached:—(1) How many prospecting parties have been sent out by the Mines Department? (2) What are the districts in which they are working? (3) What is the total cost of same to date? Answer: "(1, 2 and 3) Instructions have been issued to the Wardens of the various fields to supply rations on a liberal scale to approved persons desirous of prospecting in such localities as are approved of by the Warden, who will report and furnish vouchers from time to time. Applications have recently been received at Cooktown, Herberton, Chillagoe, Georgetown, Mackay, Rockhampton, Clermont, and Gladstone. No vouchers have yet reached this office." It is also noteworthy that a "Bill to Amend the Mining Act of 1898 by enabling special gold-mining leases to be granted for the encouragement of deep-sinking" has been introduced into and passed through the Queensland Legislative Assembly, and now awaits consideration by the Legislative Council. The bill provides, shortly, that if a lessee undertakes to sink a shaft to a depth of not less than 3,000 ft., a lease, to be called "a special gold-mining lease," of an area not to exceed 300 acres, may be granted under the new bill, and all the provisions of the Act of 1898 will apply as to an ordinary lease issued under the principal Act. In the case of these gold-mining leases proper precaution is taken to secure that there is a covenant to work the land by such number of men as is prescribed in the lease, subject to such exemption, or partial exemption, as may be granted under the Act. There is also a covenant to sink a shaft on the land to a depth to be prescribed—not being less than 3,000 ft.—and within the time to be prescribed in the said lease; and the lessee is bound, within that time, to sink a shaft in the land to the required depth; but there is a provision that if before the expiration of such time the lessee has not sunk a shaft to the specified depth, but that a shaft has been sunk to a depth of at least 1,500 ft., and the Minister is satisfied that the delay in sinking it has not arisen through causes for which he can be held responsible, he may extend the prescribed time. The principle which the measure seeks to put on the statute-book is that, in order to encourage mining, an opportunity is given to prospectors to go in for deep-sinking—that is, to endeavour to find a vein which has been previously lost, or to discover a new lode; and, in order to encourage them to go to a depth where more shallow works have given out, the Department promises that in proper cases an area of 300 acres will be granted.

At the Council meeting of the South African Association for the Advancement of Science at Capetown, on December 18, Professor Crawford occupied the chair, and there were present Professor Schwarz, Rev. Dr. Flint, and Drs. Juritz, Anderson, Lunt, and Marloth. The important question of securing legislation giving the Government control over meteorites falling within the Union reached a further stage, the idea having, on the initiative of the Association, been sympathetically discussed by the British Association during its recent session in Australia, with the result that the General Committee of that body had been asked to consider the question of drafting legislation suitable for general adoption in all lands, with the aim of ensuring that all meteorites should at least be made available for scientific examination. In this connection, it was resolved to transmit to the British Association a suggestion by Dr. Lunt that—if it was impracticable to deny ownership in meteorites to persons on whose land they fell—a tax of 50 per cent. on their value, payable in kind, might be imposed. In view of the general dislocation of affairs caused by the war, it was resolved that, before taking further steps to arrange details in regard to the next annual session at Pretoria, in 1915, the Council members there should be asked, in consultation with the Mayor, to consider and report what prospect there was of its being possible to hold a successful session at Pretoria next July.

MINING INSTITUTE.
TEACHING CENTRES:—{ JOHANNESBURG AND SCHOOL OF MINES, KIMBERLEY.
Prof. YATES prepares candidates for the following Government Certificates:—
MINE MANAGER'S. MECHANICAL ENGINEER'S.
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MINE SURVEYOR'S
by Class, Private Tuition, and Correspondence.
SOME 1914 RESULTS:—
MANAGERS - - - January and May - - - ALL Passed.
ELEC. ENGINEERS - February - - - - - 66% ,,
MECH. ENGINEERS - June (Kimberley Centre) - - ALL ,,
MINE OVERSEERS - - - - - - Practically ALL ,,
NEARLY 200 SUCCESSES. St. James' Mansions, Eloff Street.

INDUSTRIAL PROGRESS OF DELAGOA BAY AND DISTRICT.

Railway and Cooling Plant Construction—New Industries—Bright Outlook.

Notable among the works completed during 1914 is the opening of the Lourenço Marques—Xinavane railway line, says the *Gazeta de Moçambique* in its review of 1914. The primary reason for the construction of the line was to give easy and cheap transport for the products of the Incomati Sugar Estates Company. But the completion of the line will have a wider and far-reaching effect than that. At no distant date the line will be continued until it links up with the one running from Chai-Chai to Manjacase. It will also have several branch lines to serve some of the more remote agricultural regions lying away from the main line. Even at present, the new line has given a fillip to agricultural enterprise, and besides, it is largely taken advantage of by the Witwatersrand Native Labour Agency, in transporting natives recruited for the Rand mines, thereby saving them long marches from the interior of the district and entraining them direct to the compound at Ressano Garcia. The Chai-Chai line—which has been a paying one since its opening—shows steady progress in its prolongation. At first it was intended only to prolong it as far as the Inharrime river and to transport goods and passengers along the river to Inharrime, and from thence by railway to Mutamba, but now that it has been decided to continue the line to Inharrime, the work is proceeding with great celerity. From Mutamba the work of railway construction to Inhambane has been prosecuted with great vigour, so that, in a few months the connection from Mutamba to Inhambane will be completed. All that is now required to link up Lourenço Marques with both of these places—Chai-Chai and Inhambane, is that link from Xinavane to Manjacase. This section will be undertaken as soon as it is possible to get the railway material. Good progress has been made with the Quelimane line, and had it not been for the war, it would now have been well on its way towards the British Central Africa Company's line on the river Chiré. Good progress has been made in the extension of the Mozambiqno line, more railway material having arrived its extension is being continued.

Wharf Construction.

On the 10th November the last pile in the ferro concrete work on the Lourenço Marques wharf was driven, and a few days later there was a pleasing ceremony at which was witnessed the completion of the decking of the wharf, uniting the Netherland new wharf with the present one, thus giving a combined front of over 1,477 metres. Plans have also been passed by the Port and Railway Council for the construction of a dry dock to take ships up to 10,000 tons. This work will be given out in small contracts, the cost of which will be paid for out of ordinary revenue. Plans have also been prepared, and the work will be undertaken shortly, of the reclaiming of the foreshore from Allen Wack's jetty to Reuben Point. Besides these, 1914 will ever be a memorable year as it was during that period the coal-loading appliances was erected—appliances that stand out as the finest of their kind in South Africa. The work of wharf construction has been started at Inhambane. While utilising a part of the old wharf, an extended section finishing off in a T shape is now being made in ferro-concrete. With the railway bringing in produce from the sugar estates at Mutamba, and the agricultural produce from Inharrime, the wharf is bound to be a great advantage to the district, and a means in the development of its rich agricultural resources. Nothing of a definite character has yet been done as regards the site of the new wharf at Quelimane. Able engineers from Lisbon have studied the question, besides which a report has been presented by Engineer Rebeiro Arthur, of the C.F.L.M. Yet it is more than likely that the site will be decided upon early in the year. In any case, there is plenty of time to have the wharf completed in time for receiving goods from the railway now in course of construction. Regarding this harbour, in a long interview we recently had with the Governor of Quelimane, he looks upon the wharf as one of the most important undertakings before the Province. In fact, he went so far as to say that there was not the slightest doubt that it would one day become of far greater importance than the wharf at Lourenço Marques. He showed, from a map, how easy it was to capture the mail service to Australia—steamers could call at Lobito Bay, and the mails could be conveyed by rail from there right to the port of Quelimane. Quelimane would then become a great centre. From the fine rich coal fields at Tete, ships could be supplied with bunkers, and a large export trade could be done with India in export coal. Besides that, he showed how the new railway from Quelimane could easily transport the produce from the British hinterland to the sea. The Zambesi, he stated, was becoming year by year shallower, the difficulty of river transport was increasing, but with the new railway most of the important places could be easily tapped. Thus, for instance, he said, the line could run near to Mopea, where there is a large sugar factory, and that the other industries of sugar could easily transport their products to Mopea, as at that part it was easy to utilise river transport; besides the distance was inconsiderable. From what we saw last year, we have little doubt but that Quelimane has a great future before it, and that when the wharf has been constructed it will be come a busy thriving centre. Therefore, although the crisis through which we are passing, in conjunction with all other parts of the world, has been very detrimental to our development, still good progress has been made, plans have been prepared, and when peace has been proclaimed, the development of the Province will go forward with leaps and bounds.

Industries.

Although there is a wide and lucrative field, yet enterprise has not taken advantage of the profitable openings there are here for many and varied industries. Possibly the capitalist has been looking too eagerly for quick returns bringing huge profits, and has overlooked the field for profitable investment, with a sure and steady return on invested capital. To such there are in the Province of Mozambique a field wide enough to satisfy the most ambitious, and varied enough to meet the desires of all investors. In this issue we have not the space to deal with these, as our review of what has actually been done has taken up most of space available. However, we hope, at no distant date to deal fully with some of the more important industries for which there is an opening, and for the products of which there is a good and growing demand. Dealing, therefore, with present industries, we select, as of first importance that of the sugar industry. The Province of Mozambique is peculiarly adapted for such production. Its soil and climate lend themselves to the cultivation of sugar cane. If we look back, we find that during the past ten years the production has made remarkable progress, as it now stands at an output of 50,000 tons. If such has been the case during the past ten years, what will it be during the next ten years? The stage of initiation is past, as also that of experimenting. Not only are the present manufacturers increasing their output, year by year, but others are entering the field of cane growing and sugar production. Already there is established in the Lourenço Marques district a sugar factory, which even in this, the first year of its existence, hopes to place on the market something like 1,500 tons of sugar. Next year it hopes to double that amount, and so on year by year, erecting more mills as the output of cane increases. Then there is the African Agricultural Estates, Ltd., with a large area of land—also in the Lourenço Marques district—comprising 300 square miles, whose development has been retarded owing to the long drought of the past three years, but which now, owing to the copious rains, are continuing planting. Besides which, they are preparing against another season of drought through an irrigation scheme, now taken up, whereby the waters of the Incomati will flow copiously through their estate. Up the Maputo—still in the Lourenco Marques district—another area of land comprising 40,000 hectars has been taken up for sugar production. On the Limpopo, we understand, a similar area is being acquired for sugar plantation. Near Angoche another large area is being acquired for sugar. The tendency seems to be the acquiring of land in this Province for sugar. Even at this time, when one would least expect it, we are informed that applications are coming in every week for sugar land. Truly the industry of sugar production will soon become the largest in this Province, if not the largest in the world. With an abundant supply of cheap labour, with the opening up of the country by good roads and railways, there is nothing to prevent such a phenomenal growth of this industry. The nature of the industries in Lourenco Marques are few, and for the most part insignificant. The reason for this, in a measure, is accounted for by the fact that the town has too long looked upon its sphere as that of dealing with the traffic to and from the Transvaal. At present there are several engineering shops, the largest being that of the Delagoa Bay Iron Works and Slipway Company, Ltd. This workshop has turned out some heavy castings, and, as it keeps a good staff of mechanics, is a boon to steamers in port requiring repairs. In the old days most of the repairs had to be done in Durban, but now almost every kind of repair can be executed here. Besides this one, there are several other engineering shops where repairs can be executed here, but the one mentioned is a British firm. During the year (1914) the Empreza Nacional de Navegaçao—the Portuguese Mail and Coast Steamship Line—opened a workshop of their own, thus adding to the number of shops in the town. During the year an oil and soap factory, entitled the Mozambique Soap and Oil Factory, has been opened. The factory is furnished with all the latest type of machinery for the extraction of oil and the manufacture of soap. Situated as it is, in a country full of indigenous oil-bearing fruits, many of them good for the manufacture of soap, there is a good supply of the main element in this manufacture. As there is a good demand for soap in the Province, especially bar soap for natives, this new industry is sure to prove a profitable undertaking. For several years, Mr. Gunwala has been crushing the seeds of groundnuts, sessame, cocoanuts, castor, etc. All the oils extracted from these seeds have found a ready sale locally. Besides this, he utilises the crushed seed and sells it as oil cake, most of which, with the exception of castor, is used for feeding cattle; the castor is found to be a good fertiliser. This industry has now grown to such an extent that new machinery has been installed which is propelled by electricity. The flour mills are used chiefly for grinding maize, and we are informed that if farmers would grow more of the white tooth variety most of the money spent in the Transvaal, over £8,000 per annum could be retained in Mozambique.

MINING MEN AND MATTERS.

Amongst the new members of the South African Institution of Engineers are the following:—Messrs. W. A. Tester (of the Corner House); Hugh Mitchell, Manager, Langlaagte Estate; and James Whitehouse, Manager, Village Deep.

* * * *

The list of certificates issued by the Mines Department for the period ended 16th January, 1915, is as follows:—Mine Surveyors' Certificates (by examination): A. S. Corbett, W. A. Moses, L. M. Nesbitt, E. F. J. Weerts. Mine Overseers' Certificates, Metalliferous (by examination): J. Barker, E. P. Cowles, W. Edwards, F. Y. Garnett, F. Laroque, W. D. McClure, A. M. Murdoch, J. W. Newcater.

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VENTERSBURG ROAD, O.F.S.

Engineering Notes and News.

Humphrey Pump.

The directors report that the war has seriously affected the business. The directors called up the balance due on the ordinary shares, which are now fully paid, for the general purposes, and, more particularly, for the carrying out of a large pumping contract at Mex, Egypt. Unfortunately, owing to the war, this contract has been cancelled by the Egyptian Government. The contract for the five large pumps erected for the Metropolitan Water Board at Chingford has been successfully carried to completion.

Hoisting Accidents in Western Australia.

The annual report of the Department of Mines of this state contains a mass of interesting information, and among the hoisting accidents the following occurred:—At the Golden Horse-Shoe, Kalgoorlie, there were three mishaps as follows: (1) An engine-driver had just emptied a skip of ore, when his attention was diverted to reply to a question from the chief engineer, and on receiving a signal from below to hoist, he turned on steam without noticing that he had not reversed the engine. On seeing his omission he applied both brakes, but too late to prevent an accident. The skip struck the safety thimble and hung up on the safety hooks and side grippers, releasing the rope. The Whitmore overwinding device was out of action at the time. No damage was done. (2) A case of overwinding occurred, in which the hoisting engineer, who was hauling ore at the time of the overwind, had the cage at the top landing, and on applying steam to lift the cage off the chairs the reversing lever became fast, and before he could pull it back the cage was at the ring, which sheared the copper rivet in the safety hook and released the rope. No damage was done to the cage or rope. (3) The next accident was also a case of over winding, through the driver, while in the act of applying the foot-brake, missing the step and lurching forward, with the result that his left hand carried the steam handle forward and applied more steam. This gave the engine an impetus which carried the cage into the safety thimble before it could be stopped. No damage was done to the cage or shaft. At the Eclipse mine, the engine-driver fainted while lowering two men to No. 5 level, and allowed the cage to run down to the shaft bottom, causing slight injuries to one of the men. On coming to his senses the driver found one cage hung up in the safety hook, and the other at the bottom of the shaft with nearly all the spare rope off the drum. Later on in the year the same driver was killed by his engine running out of control under circumstances which point to his having most probably fainted again. The two following took place at the Great Boulder mine: (1) An overwind occurred through the driver losing control of his engine, because of the starting valve opening more easily than he expected. He was new to this work and had no right to drive the engine, as his certificate was restricted to geared engines and locomotives. No damage was done. [All hoisting engineers must pass an examination of general competency before being allowed to take charge of an engine. Editor.] (2) Another overwind was caused by the driver allowing his attention to wander while hauling an empty cage. The copper pin in the safety hook was sheared, and the cage hung up in the thimble. An inquiry was held by the board of examiners, resulting in the driver being restricted from driving first motion hoisting engines for twelve months. While hauling water at the Great Fingall, at Day Dawn, the engineer states that the tank hung a little when near the kick up while being raised, and on his applying a little more steam suddenly went up to the wheel. He immediately shut off steam and applied the brake, but not in time to prevent the overwind.

Large Gas Power Plant.

What will be the largest single installation of gas engines has recently been contracted for by Palmer's Shipbuilding and Iron Company, Limited, Hebburn-on-Tyne. Messrs. Palmer's have been considering the matter for some time past, and as a result of careful investigations have been led to the conclusion that a scheme involving large capital outlay will bring in very large returns, by reason of fuel saved and increased convenience of working in the yards, rolling mills, blast furnaces, and works. Blast furnace gas is available as fuel, and this will be utilised in four gas-blowing engines by Galloways, Limited, Manchester, and six gas electric generating units by the National Gas Engine Company, Limited, Ashton-under-Lyne. Before use the gas will be carefully freed from dust on the dry cleaning system supplied by Fraser and Chalmers, Limited, Erith, and the gas-blowing engines by Galloways, Limited, will be of the horizontal double-acting four-cycle type, each having two gas power cylinders in tandem with one air cylinder behind them. These engines are normally rated at 2,000 brake horse-power each, but are run at reduced speed for blowing. The National gas engines will be of the high-speed vertical single-acting type, each unit having twelve cylinders on six cranks, and driving a 1,000-kilowatt alternator. The blowing engines supply air to the blast furnaces, whilst the electric power generated will be used throughout the works, important electrification schemes being in hand concurrently with the gas power installation. A large number of steam boilers will be removed, and great saving in fuel is anticipated

New Patents.

428. Andrew Frederick Crosse.—A new or improved cyanicide.
429. Reginald Cleveland Bartlett.—Improvements in vehicle construction.
430. James Miners Holman and John Leonard Holman.—Improvements in or relating to rock drilling engines.
431. James Miners Holman and John Leonard Holman. Improvements in or relating to rock drilling engines.
432. Richard Norman Vyvyan and Marconi's Wireless Telegraph Co., Ltd.—Improvements in the connections of electrical condensers.
433. William Frederick Smeeth.—Improvements in or relating to clutches for winding engines or other machines.
434. William Charles Stephens and the Climax Rock Drill and Engineering Works, Ltd.—Improvements in or connected with rock drilling machines.
435. George Hay Dale.—Tent construction by uniform sectional pieces, each separate sectional piece, when not in use in tent construction, being also suitable for individual protection, etc., etc.
436. Henry Rowe Rowe.—An improved sanitary dust or refuse bin.

CENTRIFUGAL v. RECIPROCATING PUMPS.—III.

Successful Centrifugal Pumping Plant at the Durban Roodepoort Deep and Its Lessons—Important Discussion.

THE valuable paper read by Messrs. E. G. Izod and A. D. Roullard, at the last meeting of the S.A.I. of E., on the Centrifugal Pumping Plant at the Durban Roodepoort Deep, evoked the following discussion:—

Mr F. C. Sturrock associated himself with the remarks of previous speakers in expressing his appreciation of the paper just read. Every one who was interested in centrifugal pumping must feel a debt of gratitude to Mr. Izod and Mr. Rouillard for having given such a practical testimony to the efficiency and reliability of that type of pump. He wanted to offer a little criticism, not from the standpoint of opposition, but because it seemed to him that some points in the paper wanted clearing up. In the description of the plant the motor was given as being of 55 h.p. This was about 20 per cent. in excess of the power required according to the efficiency given for the pump and that, taken in conjunction with the fact that on the first test of this pump there was an excess capacity of over 15 per cent., indicated that provision was made for deterioration on the pump after it had been running for some time. Was anything of that nature kept in view, because it was remarkable that a pump designed for 375 gallons per minute should give [illegible] gallons per minute in practice? In the paragraph on the Crown Mines installation, the authors referred to certain troubles experienced. He thought it a pity they had not given some details of the troubles that were experienced, because then they could have arrived at some conclusion as to whether they were entirely the result of the grit in the water or were inherent to the design of the particular pump with which the trouble was experienced. Where they had gritty water and employed high pumping velocities, they were bound to have trouble, as wear and tear would be excessive, and trouble would also be experienced probably where they had a high pressure of 1,000 lbs. at the back of the gland if the design was faulty. A great deal depended upon the design of the pump; whether provision had been made to avoid the particular troubles experienced. He saw that provision was made for neutralising the water and thus killing the acid before it entered the pump. The cost given by the authors for this was 2·6d. per 1,000 gallons. Working it out on the basis of 10,000,000 gallons a month, it came to about £1,300 a year, a fairly big sum, and capitalising that on the basis of 6 per cent., it equalled an amount of almost £21,700. Was it not possible to build a pump of such metal that it would successfully stand the action of acid, even at these pressures, because with such a large capital sum as £21,700 to reckon with they could certainly afford to pay for a pump made of almost any metal available? The next point he would refer to was the spare parts. A curious thing that he noticed in the list of spare parts used was two items, viz., four balancing discs and five outer bushes for the discs. It would be noticed that of the spare parts used much the most expensive items had been the balancing discs and their bushes. It should not be necessary to have balancing discs in centrifugal pumps. They served no useful purpose, but, if anything, detracted from the efficiency of the pump. They had four discs at £6 each, and five bushings at £7 15s. each. At 6 per cent. that would be capitalised at £1,075, and this sum would more than pay for the additional cost of a pump designed with properly balanced impellers and without balancing devices of any kind. Another question was whether it was advisable to let water on mines get to the lowest level before it was pumped up. It seemed possible to him to collect the water at higher levels before it fell, and pump it up from those levels rather than let it go further down than was necessary. Every gallon that fell a foot represented a certain waste of power, and a statement by the authors on this point would be of great interest.

Mr. David Gilmour thought that Mr. Lawn had dealt with the early days of pumping in Cornwall in a most interesting manner, which brought home to them that plants such as had been described by the authors were stages in a continuous growth. In the profession of mining one seldom felt inclined to depart from standard practice without careful trial and experiment to test for oneself results obtained elsewhere, but probably under totally different conditions. One of the striking features in the results placed before them was the enormous benefit derivable from taking every trace of solid matter out of the water. It was astonishing that the maintenance costs had been brought to such a low figure, and this result was entirely attributable to the efficient means adopted by the authors. We had in the past deceived ourselves as to the harmlessness of a slight cloudiness in the suction sump. The care bestowed at the Durban Deep in getting rid of every destructive element was rewarded with the results now tabulated. The very simplicity of the means adopted indicated the amount of thought the authors had given to this question and how clearly they realised the importance of eliminating all solids from the suction. He judged from one of the slides thrown on the screen that the capacity of the settling basin of the sump was such that the water took about two hours to traverse it. This was not a very long time when the solids were in any great quantity or when they were of a slimy nature. The authors had not said anything about the percentage of solids in the water delivered to the suction, but no doubt it was no better in that respect that in other mines, and the paper gave one a clear idea of what could be done in a sump of comparatively small capacity. He wished to thank the authors for the paper, which he had listened to with great interest and benefit.

Mr. P. Cazalet said that Mr. Sturrock had spoken of the design of the Crown Mines and Durban Deep pumps. It would interest him to know that they were identical instruments in design and construction. As to the cost of the neutralisation of water, it was necessary to remember that this water which was pumped out of the mine was used for reduction purposes, and whether they neutralised it underground or on the surface, the cost was very slightly different. It was necessary to neutralise it before it could be used for reduction purposes, and the cost of the neutralisation of the acid was a matter that would have to be met, whether on the surface or underground. As to attempts in previous times to settle mine water, which was a point made by Mr. Gilmour, he (the speaker) thought that it had never previously been tried when the acid was already neutralised, and probably that had some effect on the time taken in settling the water efficiently. The water in the D.D. case was alkaline before entering the settling sump. Every mining engineer started with a prejudice against centrifugal pumps for underground, because they had all heard of failures. Fortunately in this case most of those concerned in the decision had had an opportunity of seeing these pumps in other parts of the world, and it was therefore less of a cut against one's prejudices or preconceived ideas to test them in this case. They had a strong advocate in Mr Izod for the introduction of this pump, and he was sure he found in this particular case that the mining engineers concerned were with the mechanical engineers in the absolute necessity for ample storage and settling capacity. It was not a case of having to fight for adequate settling and storage area, as it was on both sides agreed that this was an essential. The only people they had to convince were the financial people, to allow for the cost of the necessary excavations. Excavations for reciprocating pumps would have been much larger than required for the centrifugal pumps, the difference being wasted. This pumping plant at the Durban Deep was not put in without careful investigation as to the amount of water to be dealt with. The position of the mine was interesting, as it was in the centre of a wet district—wet that is for the Rand, and it was necessary seriously to consider the possibilities which the pumping plant might have to meet. The investigation in the Durban Deep case was exceedingly interesting and startling to him, and he could shortly describe the results by stating that there was found to be an obvious increase yearly in the amount of underground water met with, independent of rain-fall or dry and wet seasons (these records extended over eleven years). They could go further and say, however, having granted a steadily increasing minimum of water year by year, they found an extraordinary connection between the additional volume of water handled, above this minimum and the rainfall of any given period. The Corner House had decided, in view of these results, to make similar investigations and apply it to the whole of the Rand. That investigation was in progress to-day, and he hoped that the result would be available before many months were up. The assistance of anybody who had control of records of underground pumping would be welcomed, and he hoped that he might be able to submit the conclusions to the Association at a later date. These figures should be of great use to the Rand, and if not collated very soon the records might be lost. He was sure that Mr. Rouillard would welcome any members of the Institution who wished to see the pumping plant before the next meeting, or before the paper was next criticised. Details could be arranged through the Secretary. As persona lstatement he desired to thank the Institution for appointing him to fill the vacancy on the Council, which was an unusual method of rewarding a member for non-attendance.

Brakpan Mines.

The working profit earned by the Brakpan Mines during the quarter ended December 31 totalled £76,727 4s. 11d., or 9s. 4·753d. per ton milled. The working costs averaged 18s. 3·431d. per ton. The capital expenditure amounted to £1,014, and the excess expenditure on development to £3,735. The linear development for the quarter amounted to 6,677 feet, of which 1,460 feet were on reef averaging 9·07 dwts. over a reef width of 36·54 inches. Of the footage on reef 2,240 feet were in payable areas and averaged 14·72 dwts. over 39·10 inches.

Springs Mines.

The linear development at the Springs Mines during the quarter ended December 31 totalled 2,016 feet. Of the footage sampled during the quarter, 73 per cent. was in payable areas and averaged 34·47 dwts. over 34·14 inches. A similar analysis of the total development to date shows 54½ per cent. of payable footage averaging 22·68 dwts. over 26·69 inches. The main incline was successfully connected November 14. The Rand Water Board took 73,693,000 gallons of water during the quarter.

Electrical Notes and News.

ELECTRICITY STATISTICS ON THE WITWATERSRAND.

On the visit of the South African Institute of Electrical Engineers to Kimberley during July the statistics recently printed in our columns were presented at the Congress of the South African Association for the Advancement of Science. The record was in tabulated form, and in introducing the subject, Mr. W. Elsdon Dew, President of the S.A. Institute of Electrical Engineers, said:—

The subject matter which I have the honour to present to this section of the South African Association for the Advancement of Science touches on that branch of Science which has made the greatest advance during the last decade. A few years ago the use of electricity on the Witwatersrand was but a very small proportion of the total power in use. To-day its proportions are enormous, and the actual work being done, and how electricity is doing it, is recognised by the whole world as one of the greatest advances in engineering. South Africa, with its many great attractions and the vastness of its territories, is progressing at a great rate. The span of our life is filled up with so much that has happened in the applications which science has made possible, that I am rather diffident in prophesying still further advances for that branch of scientific engineering to which I have the honour to belong. If you will excuse my doing so, I hope that by prophesying and bringing to your notice the following, it will bear good fruit, and assist those who can assimilate great ideas, and are able to carry these out, to give attention to the point. We all look forward to South Africa's advance in the direction of agriculture. It is fully recognised that South Africa must take up its responsibilities and become a producing country, and help to supply the necessities of life to those other countries that are so thickly populated that there is not enough ground or land to produce these necessities upon. The advancement of science will be able to make South Africa such a country. If I predict that with the electrification of the railways in this country there will follow the supply of cheap power for the use of the farmer, for him to develop his land, assisting him in ploughing his land, supplying him with water, etc., so that he can produce all that a good Providence has made it possible for South Africa, the land of sunshine, to produce for the benefit of mankind. In making this suggestion, and, if I may call it a prophecy, I do so feeling as one who recognises the great influence electric engineering has in achieving the advancement of a country's progress. I now beg to call your attention to some interesting figures as given in the statistics* You will note that the largest units in use are 18,000 k.v.a. capacity, and are some of the largest units in the world, being only exceeded to-day by one or two larger units in America. The figures as to transmission voltage showed that at 80,000 they were approaching the extreme high voltage beyond which they were unable to go, especially in these high altitudes. The statistics relating to the length of transmission lines pointed to the possibility which electrical engineer realised to be within the range of engineering. The utilisation of all the water powers of the country. Amongst others I refer specially to the utilisation of the water power at Victoria Falls. I see no reason why this enormous power should not be used to give power to all South Africa for its development in agricultural and other directions. The importance of using these natural sources of power is now fully recognised, and in the future development of this country cheap power will ensure rapid progress in many ways. The coupling up, electrically, of power plants now ensures continuity of service, as well as cheap supply of power in bulk. Personally, I see no great difficulty in the development of such large sources of power, which in years to come will be both a financial success and will have made possible industrial expansion, which this country must look forward to. On reference to the load factor of the power plants on the Witwatersrand, this may be considered as being exceptional, for it is not often that a load factor of 70 to 80 per cent. obtains in electrical power supply. Sheet B is perhaps only of academic interest, but to the many engineers these figures will, perhaps, direct attention to the different directions in which electrical engineering is depended upon for the carrying out of the great work being done in the production of the gold supply to the world. In regard to surface winders: on the Witwatersrand will be found some of the largest electric winders in use in the world, and the successful operation of these great machines is perhaps the greatest achievement in electrical engineering we have seen during the period under review. I need hardly refer to the amount of controversy which has gone on in this subject, and the operations of these plants is most gratifying to those who have been responsible for their adoption. Sheet D gives some particulars of the largest electric winders in use. I would like to draw your attention to the figures on Sheet C. The system of supply of compressed air on the Witwatersrand is the most important in the world. The conception of this most important method of working was first thought of by Mr. A. M. Robeson, whose name is so well known to all engineers in South Africa. I am sure the figures of two and a quarter million tons of compressed air per annum is not comprehensive. I am sure amongst the many problems of electrical engineering the combined use of synchonous motors driving rotary air compressors, together with electric power for mining operations, is perhaps a unique instance where the problems have assisted one another to the greatest extent possible. The paper was then discussed amongst the members of the Congress present, and Mr. J. W. Kirkland (Past President), in speaking on the subject, referred to the importance of the supply of cheap power, and that its importance was as great as the cheap transport of materials, as is recognised by every country. By the supply of cheap power development and expansion will be assured in the country.

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* These statistics were printed in recent issues of the "S.A. Mining Journal."

The Electrical Trade.

A speaker before the British Electrical Sales Managers' Association recently reviewed the export trade in detail. He made reference to the well-known case of the Victoria Falls and Transvaal Power Co. As will be remembered, the company was able to go to a large German works which supplied the whole of the plant for its generating stations, accepting payment in debentures. This was not sufficient to keep the company going, and it was then able to dispose of all its preference stock, as previously it had disposed of its ordinary shares, on the English market without spending a penny on electrical manufactures in this country. Obviously the company, in the opinion of the speaker, made a good contract for the machines, but other things were necessary. The Rand mines had to buy motors, and they invited tenders from both British and Continental firms. With one or two exceptions all the orders went to German capital on prices. The prices were such that the British firms would have lost heavily if they had attempted to undertake the work. That, however, did not mean that the German manufacturer was going to sell machinery in South Africa with no profits for himself. Where the Germans have scored is that makers there who construct large machines also produce smaller types, and they are able to sell everything that is called for in one schedule. Therefore they can afford to sell the large machines at no profit in order to obtain a footing in the country which will eventually give them orders showing profits. Continental manufacturers have realised that the value of large machinery lies in the advertisement which it gives, whilst the smaller machinery and accessories yield the profits. "The circumstances set forth," the speaker proceeded to remark, "indicate that, in order that we may take advantage of the situation we must show the same combination and co ordination whereby we can enter foreign markets and compete on a better basis, so that a good deal of reorganisation will be necessary. Taking the before-mentioned figures as they stand, we observe that Germany may be on the point of losing an export trade of £14,000,000; how much of that can be secured? If we were to increase the British output by 25 per cent. we should only be up to the normal requirements of our own country. If we are to make hay while the sun shines we shall have to enlarge our industry very considerably. That calls for great financial support, patience and rearrangement on the part of British manufacturers. It is possible we may obtain such support, but it should not be assumed that we can go to these markets and pick up the work as other countries have done. A partial solution may possibly be found by co-operation between the various sections of the industry, but it is beyond the scope of this association to set forth a definite scheme. When financial operations are sought in the City of London, it is to be hoped that the financiers concerned will bear in mind that if any electrical machinery is involved in the work they are undertaking, there is at home an industry which is worth supporting. Another point in the matter of co-operation and co-ordination concerns the customers. British manufacturers are always said to be wrong, and the customers right. But it is felt that customers might have a little more consideration for our standards, and not insist upon others and upon requirements dictated by whims. Other people say we do not give customers what they want, but many of us know that attempts to modify patterns may involve a considerable sum of money, and in many cases it would not be worth while to carry out the modifications. In conclusion, the speaker again emphasised the necessity for combination and co-ordination in order to show a united front in the world's markets; he thought that we should thereby help to place the industry on a stronger and more permanent foundation than hitherto, and said that the industry was full of immense possibilities if we could get the necessary financial assistance and also secure co-operation among ourselves."

The British South African Explosives Company, Ltd (incorporated in England), is advertising its list of directors, "in view of the slight misunderstanding that seems to exist in regard to the constitution of the above company's board."

THE WEEK IN THE SHAREMARKET.

Steady with Widening Tendency—State Mines Still Sold.

THE general tone of the market is steady with an improving tendency, and the list of active stocks lengthens daily. In London interest in the Rand is gradually returning, and there is reason to hope that some of the capital diverted now from foreign markets may turn towards South Africa. The embargo on new issues may likewise have a stimulating effect on active stocks, as much idle money will thus be accumulated. The weakness in State Mines was a feature of the week, the selling being attributable to the tardy realization by some holders of the fact that the Government is entitled to a substantial share of the profits, and that the very size of the mine may call for further capital expenditure. There is nothing new, of course, in either of these reasons, and people who give them as their motives for selling confess themselves very badly informed. Otherwise, Far East Rand stocks remain in favour, and undoubtedly that area is to-day more than ever the hope of these fields. The week's fluctuations are detailed below:—

	Fri., 15th.	Sat., 16th.	Mon., 18th.	Tues., 19th.	Wed., 20th.	Thurs., 21st.
Adair-Ushers ..	—	0 3*	0 3*	0 3*	0 3*	0 3*
African Farms ..	—	8 6*	8 6*	8 7*	8 6*	8 6*
Apex Mines ..	12 3*	12 6*	12 6*	12 6*	12 9*	13 0*
Bantjes Consolid...	—	9 0*		8 3*	8 3*	8 0*
Brakpan Mines ..	43 9*	44 0*	44 0*	44 3*	45 6*	45 0*
Breyten Collieries..	20 0*	20 0*	20 0*	20 0*	—	20 0*
British South Africa	—	—	—	12 0*	12 0*	12 0*
Bushveld Tins ..	0 4*	0 4*	—	0 4*		0 4*
Cassel Coals. ..		8 0*	—	—	—	—
Cinderella Cons. ..	2 6*	—	—	—	—	—
City & Suburbans..	41 6†	40 6*	41 6a	40 6*	40 6*	40 0*
City Deeps ..	56 0*	56 0*	56 0*	57 6*	57 0*	57 0*
Cloverfield Mines ..	4 4*	4 3*	4 0*	4 3*	4 3	4 1*
Clydesdale Colls. ..	8 0*	—	8 0*	—	8 0*	—
Con. Langlaagte ..	31 9*	32 9*	32 9*	—	32 6*	32 6
Con. Main Reef ...	16 9*	17 0	16 9*	16 9*	16 6*	17 0
Cons. Mines Select.	—	—	—	—	7 6*	—
Coronation Colls. ..	21 0*	21 0*	21 0*	21 0*	21 0*	21 0*
Coronation Freehds	—	—	—	0 2*	0 2*	—
Crown Mines ..	—	87 6*	—	—	82 6†	82 6
East Rand Centrals	2 1*	2 2*	2 0*	2 2*	2 2*	2 2*
East Rand Coals	1 8*	1 6*	1 5*	1 6	1 7†	—
East Rand Deeps	1 5*	1 5*	1 5*	1 6*	1 5*	1 4*
East Rand Props...	—	27 6*	—	27 0*	28 0*	27 6*
East Rand Debs. ..	£85*	—	£85*	—	£85*	—
Eastern Golds ..	1 1*	1 1*	1 1*	1 1*	1 1*	1 1*
Frank Smith Diam.	1 4*	1 4*	1 4*	1 6	1 5*	1 4*
French Rands ..	—	1 0†	—	—	—	—

*Buyers. †Sellers.

	Fri., 15th.	Sat., 16th.	Mon., 18th.	Tues., 19th.	Wed., 20th.	Thurs., 21st.
Geduld Props. .	20 0*	20 9*	20 9	20 9	21 0	20 9*
Glencairns ..	1 0*	1 0*	1 0*	—	1 0*	1 0*
Glencoe Collieries	5 9*	—	5 9*	5 9*	5 9*	5 9*
Glynn's Lydenburgs		9 0*	10 6*	11 0*	11 0*	10 0*
Government Areas..	20 0	19 9*	19 3*	18 9*	18 6*	17 6
Jupiters	4 0†	—	4 0†	4 0†	4 0†	2 6†
Kaalfontein Diam..	0 2*	0 4†	0 4†	—		0 3*
Klerksdorp Props. .	3 0†	—	—	2 9†		—
Knight Centrals ..	5 8*	5 7*	5 6*	5 7*	5 6*	5 6*
Knights Deep ..	30 0†		—	27 6†	—	—
Lace Props., ..	3 3*	3 0*	3 3*	3 0*	3 0*	3 0*
Luipaardsvlei Est.	10 0†	7 6*	7 6*	7 9*	7 6*	—
Lydenburg Farms. .	2 6*	2 6*	2 6*	2 6*	2 8*	2 6*
Main Reef West ..	5 9*	6 0*	5 11*	—	5 9*	—
Meyer & Charltons	—	92 6†	88 9*	90 0*	—	—
Middlevlei Est. ..	1 7	1 6*	1 6*	1 6*	1 6*	—
Modder B's ..	81 0*	82 0*	82 6*	83 0*	83 0*	85 0‡
Modder Deeps ...	59 6*	60 6	61 6	61 0	61 6	61 6
National Banks ..	—	—	—	£10¾*	—	—
New Era Cons. ..	—	4 10*	4 9*	4 10*	4 10*	5 0
New Geduld Deeps.	1 9*	1 9*	1 9*	1 9*	1 9*	1 9*
New Gochs ..	12 3*	—	12 6*	12 6*	12 6*	12 6*
New Kleinfonteins	19 3*	19 9	19 9	19 9	20 0	19 9
New Modderfontein	250 0*	251 3*	252 6*	256 3*	252 6*	255 0†
New Unifieds ..	17 6*	—		—	17 6*	20 0‡
Orange Diamonds .	—	0 7*		0 8*	—	—
Pretoria Cements...	39 6*	39 6*	40 0	40 0*	40 0	
Rand Klips ..	3 0*	3 0*	3 0*	2 10*	2 10*	2 11*
Rand Nucleus ..	1 6*	1 6*	1 6*	1 6*	1 6*	1 6
Randfontein Deeps.	2 9*	2 6*	2 10*	2 9*	2 10*	2 10*
Randfontein Est...	—	15 0*	15 0*	15 0*	16 0*	16 0*
Rooibergs... ..	19 6*	20 0†	20 0†	19 6*	19 3*	—
Roodepoort Uniteds	6 0†	6 0†	—	—	—	6 0†
Shebas	—	—	—	—	3 0†	3 0†
Simmer Deeps ..	1 0*	1 3*	1 5*	1 6*	—	1 6*
S.A. Lands ..	2 4*	2 3*	2 2*		—	2 3*
Springs Mines ..	12 6*	12 5*	12 6*	12 6*	12 9*	13 0*
Standard Bank ..	—	£9½*	£9½*	£9½*	—	—
Sub Nigels ..	9 0*	—	9 0*	—	9 0*	9 0*
Swaziland Tins ...	20 0*	20 0*	20 0*	20 0*	—	20 0*
Transvaal Coal Tst.	27 6*	28 0*	—	—	28 3*	29 6*
Trans. G.M. Est. ..	—	36 6†	—	—	—	30 0*
Van Ryn Deeps ..	45 3	46 6	46 6	46 0	45 6*	45 6*
Village Deeps ..	35 0	35 0*	—	—	35 6*	—
West Rand Cons...	—	3 6*	—	—	3 9*	—
Western Rand Est..		2 0†	2 0†	2 0†	—	—
Witwatersrands ..	—	58 0*	—	63 0†	59 6*	59 0*
Wit Deeps.. ..	—	—	—	—	36 0*	—
Wolhuters	12 0*	12 2*	12 6	12 3*	12 6	12 3*
Zaaiplaats Tins ..	21 0*	21 0*	21 0*	21 0*	21 3	—

*Buyers. †Sellers. ‡Ex London. a 50 shares.

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Largest and oldest established Manufacturers of Portland Cement in South Africa.
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Commerce and Industries.

Kynoch's Factory.

It is stated officially that Kynoch's will shortly make extensive additions to their explosives factory at Umbogintwini, Natal. No details are obtainable officially, but it is unofficially stated that extensive contracts have been received which will necessitate the construction of two new factories, and that the particular explosives to be manufactured will mean a very large consumption of wattle wood.

* * * *

Institute of Industry and Commerce.

A meeting of the Imperial Advisory Council of the Institute of Industry and Commerce was held in London in mail week, for the purpose of considering the best means of approaching the various Dominion Governments with a view to abolishing the payment of licence taxes payable by British commercial travellers in the Dominions and colonies, and also for the purpose of considering the best means of bringing about the standardisation of company law throughout Great Britain, the Dominions, and colonies, in order to facilitate commerce within the Empire. After carefully considering the proposals, the Council decided that a memorandum should be drawn up by the Institute, after consulting with the leading specialised trade organisations, and that this memorandum be submitted to the agents-general of the Dominions and colonies for submission to their respective Governments.

* * * *

African Banking.

The report of the African Banking Corporation, Ltd., for the year ended 30th September last, presented at the meeting on the 7th inst., states that the profit and loss account shows a gross profit of £231,492, including £21,194 brought forward. After deducting current charges and rebate, the interim dividend at the rate of 8 per cent. per annum paid on 3rd July, carrying £2,800 to staff guarantee and savings fund, and allowing £1,314 for depreciation of furniture, there remains £39,477, which the directors propose to apply as follows:—Dividend at the rate of 4 per cent. per annum for the half-year ended 30th September, 1914, subject to deduction of income tax (making 6 per cent. dividend for the year), £12,000; balance to be carried forward £27,477.

* * * *

An Insurance Innovation.

It is rumoured that the South African Mutual is contemplating opening a branch in London, and in due time, when the necessary powers have been obtained, we may expect to see this society an active competitor for business in Great Britain. Colonial life offices have certain advantages over the home institutions their opportunities for remunerative investment are generally more favourable—but, even so, the establishment of a British branch is, at best, a doubtful proceeding. Life business is probably more difficult to obtain in the Old Country than in any other part of the world a state of affairs that has been brought home to many a man with a successful colonial record. It is not merely a question of appointing representatives and spending money. Many years must elapse before a colonial life office becomes so well known as to attract sufficient business to make the British branch a success. The South African Mutual would certainly start under favourable auspices. Established in 1845, it can now show a premium income of £580,000 and an assurance fund of £6,600,000. Its annual new business exceeds £2,000,000 in sums assured, and, unlike some colonial offices, it is able to obtain these handsome results without undue expenditure. For over twenty years the bonus has been at the rate of 35s. per cent. per annum, while the strength of the reserves is beyond criticism. The South African Mutual would certainly be a formidable competitor in England; but it is doubtful whether even so prosperous an office would meet with sufficient support to justify the course now apparently under consideration. The establishment of a London branch would, however, be a great convenience to the society's present members, and would do much to conserve existing connections. This reason will no doubt influence the directors when the question comes up for final consideration.

* * * *

Germany's Isolation.

The following statement, with reference to the cable isolation of the German and the Austro-Hungarian Empires has been given out by the German Information Service:—

"Germany has five cables ending at the Island of Borkum, in the North Sea, one going to Brest, in France; one to Vigo, in the north of Spain; one to Teneriffe, on the Canary Islands at the north of Africa, and two by way of the Azores to New York. All five lead through the English Channel, so that it was not difficult for England to cut them. On the other hand, it will be very difficult, even impossible, for Germany to repair them as long as the war lasts. Between Germany and England there exist six cable lines, partly German, partly English, which, of course, are not used now. From Germany's west coast, therefore, no communication with the world is possible. The telegraphic communication via Holland, Denmark, Norway and Sweden can only be kept up by cables that end in England and France, where, of course cabelgrams are censored. The ways to the south via Austria or Italy are also blocked, as the cables that run from west to east in the Mediterranean belong to an English company, the Eastern Telegraph Co., and end in English territory. The cables starting from Italy, and also from Turkey, go via Malta, Gibraltar and Lisbon to the Atlantic Ocean. With Africa no communication is possible without using the cables of the Eastern Telegraph Co., and telegraphic land connections with China pass through Russia or British India. Therefore, with the exception of the wireless service, Germany can telegraph only to Austria-Hungary, Holland, Switzerland, Italy and the Scandinavian countries. Spain and Portugal are cut off, too."—"Telegraph and Telephone Age."

* * * *

Labour Conditions.

The Labour Bureau speaks encouragingly of the Government Farm at Moddertontein, where employment for about 160 men is found. Many of these have proved good and efficient workers. About 1,800 morgen of land have now been ploughed, and cultivation has now reached varying stages of progress. The report expresses incidentally surprise that in view of the rebellion and war operations the demand for labour on farms is not pronounced. The building trades on the Rand are dull, public and private enterprises showing no improvement. Engineering has kept up pretty well, and has not been affected as much as the building trade. The Capetown report speaks of the maintenance of industry despite the rebellion, and commends half-time arrangements, whereby acute distress is avoided in trades which are slack. The month of December, says the report, has been a good one for industries at the Cape. Military operations have created a big demand for blacksmiths, farriers, heavy bootmakers. Engineering on the whole is satisfactory; building and allied dull; furniture suffering a severe setback, and some firms have hinted at closing down till normal conditions prevail again. In clerical occupations, all hands are still employed, but continuation would probably necessitate retrenchment at an early date.

Waterfall Estate.

The ordinary general meeting of shareholders in the Waterfall Estate and Gold Mines, Ltd., was held in mail week. Mr. Edmund Davis presided, and the report for the year ending June 30 last, showing gross receipts amounting to £387 as against £411 for the previous year, and a loss of £334 as against a loss of £298, was adopted.

HIGH MINING SALARIES

For those holding Certificates as Mine Managers, Mine Surveyors, Mine Captains, Mechanical and Electrical Engineers and Engine Drivers. Private Individual Tuition and Correspondence lessons where personal tuition is impossible. Practical Mathematics and Electrotechnics.—E. J. MOYNIHAN, Consulting Engineer, 35 6, Cuthberts' Buildings, Box 2061, Johannesburg.

Companies Registered in December.

4536. Potchefstroom Farmers' Produce Agency, Ltd., Erf No. 124, King Edward Street, Potchefstroom; capital, £4,000.
4537. Rock & Co., Ltd., 23 Kerk Street, Johannesburg; capital, £15,100.
4538. Gromer, Ltd., No. 27, Balmoral Chambers, Fox Street, Johannesburg; capital, £500.
4539. Yeoville Laundry, Ltd., No. 21, Nind Street, Doornfontein; capital, £200.
1540. Ysebrand & Co., Ltd., 44 Simmonds Street, Johannesburg; capital, £8,000.
1541. Golden Hill Mine, Ltd., 151, Stock Exchange Buildings, Johannesburg; capital, £12,000.
4542. The Schapenrust Colliery, Ltd., No. 212, Consolidated Buildings, Harrison Street, Johannesburg; capital, £15,000.

FOREIGN COMPANIES.

4515. Rhodesia, Limited, C/o South African and General Investment and Trust Co., Ltd., Trust Buildings, Fox Street, Johannesburg; capital, £600,000.

ALTERATIONS AND ADDITIONS TO FOREIGN COMPANIES

5331. Stephen Fraser & Co., Ltd., Johannesburg.

PROSPECTUSES.

4541. Golden Hill Mine, Ltd., Johannesburg.

CHANGE OF NAME.

4499. Hanover Rubber Co., Ltd., Excelsior Rubber Co., Ltd., Johannesburg.
4414. Riordan, Sheir & Co., Ltd., Riordan & Co., Ltd., Johannesburg.

SPECIAL AND EXTRAORDINAY RESOLUTIONS.

4200. Bates & White, Ltd., Pretoria: power of directors.
2304. The New Rand, Limited, Johannesburg; amendment of articles.
4152. Randfontein Exploration and Development Co., Ltd., Johannesburg; increase of capital.
4272. Mafeni Minerals, Limited, Johannesburg; liquidation.
4513. Model Steam Laundry, Ltd., Johannesburg; borrowing powers.
4047. Wybert Frederick, Limited, Johannesburg; liquidation.
2009. Alberton Estate Syndicate, Ltd., Johannesburg; reduction of capital.
2401. The African Land Corporation, Ltd., Johannesburg; liquidation.
3825. South African (Vryheid) Coke Co., Ltd., Johannesburg; liquidation.

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NOTICE OF INCREASE AND DECREASE OF CAPITAL.

4104. Roseneath Estate, Ltd., Johannesburg; increase from £750 to £1,250.
2009. Alberton Estate Syndicate, Ltd., Johannesburg; decrease from £20,000 to £11,592.
4254. Franco Colonial Co., Ltd., Johannesburg; increase from £1,000 to £1,750.
4152. Randfontein Exploration and Development Co., Ltd., Johannesburg; increase from £6,000 to £10,000.

THE FOLLOWING COMPANIES HAVE BEEN PLACED IN VOLUNTARY LIQUIDATION.

4272. Mafeni Minerals, Ltd., Johannesburg.
4047. Wybert Frederick, Ltd., Johannesburg.
2401. The African Land Corporation, Ltd., Johannesburg.
3825. South African (Vryheid) Coke Co., Ltd., Johannesburg.

NOTICES OF CHANGE OF ADDRESS.

4522. Anglo-German Exploration Co., Ltd. (foreign), C/o Thomas Rattey, Malidyke Mine, Pilgrims Rest.
4212. Haarhoff & Bennett, Ltd., 47a, Loveday Street, Johannesburg.
4345. The National Investment and Trust Co., Ltd., Fox Street, Johannesburg.
3026. Norcar Gold Mining, Ltd., No. 2, Transvaal Bank Buildings, Johannesburg.
4466. North Bonanze Gold Mining Co., Ltd. (foreign), C/o 152, Stock Exchange, Johannesburg.

FOREIGN COMPANIES CEASED TO CARRY ON BUSINESS IN THE TRANSVAAL

3476. The W. S. Tyler Co., Ltd.
3960. Union Electric Co., Ltd.

The National Bank of South Africa, Ltd.

NOTICE TO SHAREHOLDERS.

With reference to the Resolution passed at the Extraordinary General Meeting of 29th September last, the amalgamation with the Natal Bank, Ltd., having been effected, Shareholders are informed that the Directors have decided to offer the balance—8,000 to 9,000—of the 50,000 shares created in connection with the purchase of the Natal Bank, Ltd. (i.e., the portion of the said 50,000 shares in respect of which Natal Bank Shareholders exercised their option to take cash) for subscription at £11 10s. per share.

Applications for these shares must be lodged with the Head Office of the National Bank of South Africa, Ltd. (Share Dept.), P.O. Box 434, Pretoria, on or before 1st February next.

Forms of application may be obtained at any of the Branches of the Bank.

By Order of the Board of Directors,
C. P. MATHEWS, Secretary.

Pretoria,
13th January, 1915.

Glynn's Lydenburg, Ltd.

(INCORPORATED IN THE TRANSVAAL.)

DECLARATION OF DIVIDEND No. 27.

AN INTERIM DIVIDEND of 10 per cent. (2s. 0d. per share) has been declared by the Board for the half-year ending 31st January, 1915.

This Dividend will be payable to Shareholders registered in the books of the Company at the close of business on 31st January, 1915.

The Transfer Books will be closed from 1st to 7th February, 1915, both days inclusive.

The Dividend will be payable to South African registered Shareholders from the Head Office, Johannesburg, and to other shareholders (except those resident in Germany, Austria and Turkey, and their Colonies), from the London Office, No. 1, London Wall Buildings, London, E.C., on or about the 4th March, 1915.

By Order of the Board,

Transvaal Consolidated Land & Exploration Co., Ltd.,
Secretaries.

W. E. S. LEWIS, Secretary.

Head Office—The Corner House, Johannesburg.
21st January, 1915.

THE SOUTH AFRICAN

Mining Journal,

WITH WHICH IS INCORPORATED

South African Mines, Commerce and Industries.

ESTABLISHED 1891.

VOL. XXIV., PART I.] JANUARY 30, 1914. [No. 1218.

HEAD OFFICE: 176-180, Stock Exchange Buildings, Fox Street (2nd Floor), Johannesburg, Union of South Africa.

Telephone **913.** P.O. Boxes **963** and **418.**

Cable and Telegraphic Address: **"MINING JOURNAL."**

AGENTS FOR GREAT BRITAIN: Argus Printing and Publishing Co., Ltd., Byron House, 82-85, Fleet Street, London, E.C.

AMERICA: Advertisements accepted from any recognised Advertisement Agency.

ANNUAL SUBSCRIPTION RATES: Oversea, £2; South Africa (by post), £1 10s.; Local Delivery (Town only), £1 6s.

Copies of this journal are obtainable at all Branches and Agencies of the Central News Agency, Ltd., at all News Agents and Railway Bookstalls throughout South Africa, and at the London Agency as above.

NOTICE.—The postage of this issue of the *S.A. Mining Journal* is: South Africa, 1d. All other parts, 1½d.

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Notes and News.

A Tin Boom? With tin fetching £165 10s. for cash in England, and "talked" very much higher, there is a reasonable prospect of better times for that department of our mining industry. The December export, it is noteworthy, was the best since June last, the total value being £29,812 for the month against £24,277 for November. Copper export in December, it may be noted, touched the high-water mark for the year, being valued at £41,406, beating the previous best, that of March, by £1,381. The recent activity in Zaaiplaats may be attributed to the expectation of a good tin market coupled with news of better development at the mine.

* * * *

The New Taxation. In six weeks' time we shall know all about the new taxation that General Smuts has been preparing for us, but meanwhile we cannot prevent coming imposts casting their shadows before. Although a sphinx-like silence holds in its grip those who are supposed to be in the confidence of the Government in regard to its forthcoming financial proposals, it needs no Sherlock Holmes to guess one or two things, the realization of which may help to soften the blow when it does come. In the first place, the new taxation is not likely to trouble our farmer friends to any extent, if at all. Indeed, some people are already predicting a land boom as one result. The mining industry and the industrial community will, as usual, have to contribute most of the new imposts, and since none of us wants to embarrass the Government in these critical times, the voice of protest will, doubtless, be temporarily hushed in the land. Later on when peace comes, the long-suffering Rand will doubtless assert itself and give tongue to its growing taxation grievances.

* * * *

An Explanation and an Apology. A most unfortunate mistake was made by us in attempting to review the interesting impromptu discussion that took place at the last meeting of the South African Institution of Engineers. It was the first debate of this kind by members of this Institution attended by the Editor of this paper, and he was unaware of the fact that the proceedings were private. His criticism of the views expressed has therefore naturally given rise to justifiable resentment on the part of the Council and the members at our lapse into what are regarded as unwarranted strictures on views expressed on what they, unknown to us, held to be a privileged occasion. Our offence is not mitigated by the fact that in what was admitted to be a very imperfect notice of a lengthy debate it was not possible to do justice to the views of several of the speakers, and the fact has led to misunderstanding of their attitude. The point is also raised in regard to our articles that since they purported to give the views of well-known engineers on certain technical questions they should have been submitted in proof form to their authors—a courtesy which this paper has always tried to observe. The answer is that our articles did not purport to be reports of the proceedings at the meeting. They were, in fact, our criticisms of the political and the economic rather than the technical views expressed, and it is not usual to submit critical editorial articles to the objects of the criticism. Since, in offering that criticism, we have, as we are told, not only seriously misrepresented the views of the speakers, but published matter really meant to be private and privileged, we unhesitatingly withdraw the articles in question, as far as it is now possible to do so, and express regret for our mistake. In the interests of the Institution, we may be permitted to hope that this *contretemps* will not be allowed to damp the new-born dialectic ardour aroused by its impromptu discussions.

1914 in Finance.

From the South African point of view, the most important event of last year was the successful flotation of the Union loan of £4,000,000 in 4 per cent. consolidated stock, redeemable 1943-63. In view of the times, the public response to the Union's appeal was quite up to expectations, the margin which the underwriters were called upon to take being no more than was generally anticipated. After an absence of five years, Pretoria re-appeared as a public borrower, a loan being raised of £750,000; while, at the close of the year the Durban Municipality invited applications for £350,000 5 per cent. registered stock. Unfavourable as conditions have been to the flotation of fresh enterprises, the number of new companies registered during the year was well up to the average. In mining and industrial enterprises in the Union, new capital from the United Kingdom has been invested to the extent of £1,930,750, the bulk of this capital having been attracted to Rhodesia. That the tendency to put up capital for fresh enterprises diminished with the advance of the year is apparent from the following figures, showing the money subscribed for new companies during the four quarters of 1914: March, £852,250; June, £488,100; September, £384,250; December, £206,150.

* * * *

Oceana Development.

A year ago the Oceana Development Company acquired in the Belgian Congo a concession over 75,000 square miles, with the right to select 1,370,000 acres carrying exclusive rights of research. A prospecting expedition was sent out in February and arrived, via Lobito Bay, in June at Dilolo, which is in the extreme southern portion of the concession, nearest to the Union Minière territory. From a circular sent to the shareholders it appears that a large extent of country has been explored and prospected, and two areas aggregating about 100,000 acres have been located. On the outbreak of the war operations were suspended, and the issue of the accounts for 1913 has been postponed. In the early part of the present year a few small sales of land in the Transvaal were effected, but at the moment all further business is checked.

* * * *

Congo Diamonds.

There arrived in Kimberley a few days ago Mr. and Mrs. E. R. Drysdale, who are on a return visit to the city after several years' absence in the Belgian Congo, says the *Diamond Fields Advertiser*. Mr. Drysdale's acquaintance with Kimberley dates from 1872, and he lived on the diamond fields, except for occasional trips to other parts of the country, until five years ago, when he went to the Congo on behalf of the Tanganyika Concessions to report on the Kundelungu Plateau diamond discoveries in the Katanga. His original object was merely to examine and report as a diamond expert, but he has since remained in charge of the mine. The mine is now run jointly by the Tanganyika Concessions and the Belgian Govern ment—and Mr. Drysdale speaks of the fields having developed in a satisfactory manner. On the eastern slopes of the plateau, where this property is situated, there are some eleven " pipes," and the ground bears a distinct resemblance to the yellow and blue grounds of Kimberley. On the western slopes is another diamond field, worked by the Symkat Syndicate. The mining work is still only in its prospecting stage, and consists entirely of open workings. There is a good supply of " boys " obtained through the local labour bureau, which engages the hands for 12 months. Some are very raw natives, who have to be trained in manual labour; the majority of the " boys " are of the Baluba tribe, but the copper mines in the Katanga engage natives from North West Rhodesia. Mr. Drysdale speaks highly of the mineral wealth of the country, which is likely to be greatly developed by the linking of the Lobito Bay railway with the Congo territory line. Pastoral and agricultural pursuits are in their infancy, but blessed as the high lying parts are with an admirable climate there is plenty of scope for enterprise in this direction. The high plateau, which is 5,300 feet above sea-level, is all bush country, and there is an abundant water supply. The climate, says Mr. Drysdale, is far better than that of Kimberley.

Natal Navigation.

During the week we received the following wire from Mr. J. Townly Williams, Managing Director of the Navigation Collieries:—" Navigation Collieries have not taken up two properties in Vryheid district. They have only entered into prospecting agreements. Their taking up the properties will depend on results prospecting and on other conditions."

* * * *

Geological Society.

The annual meeting of the Geological Society of South Africa was held at the Chamber of Mines last Monday night. There was a small attendance. Mr. D. P. McDonald, the Chairman, said it was to be noticed that the membership of the Society has again decreased during the past year. The decrease was undoubtedly due to a variety of causes—some of which were outside their control. Strong membership was essential. If only they could attract the younger men who were entering the mining world, they would overcome the handicap easily. He pleaded with the members to take concerted action to attain a higher membership. Regret had to be expressed at the death of Mr. Melville, one of their oldest and most valued members. He regretted that the number of papers read during the session was not up to expectations. However, considering the extraordinary nature of the times he thought they might say they had done fairly well. He thought it would be possible to meet a need in the way of accommodation for the library, and to provide a new room for that purpose in the near future. Thanks were due to the Government for the annual grant which they gave to the Society. It was of the very greatest help. Unfortunately, owing to the war the grant would be withdrawn during the coming year. He also thanked the Municipality for its assistance, which was greatly appreciated. The report and accounts were adopted, and the following officers were elected:—President, Dr. A. W. Rogers; Vice-Presidents, Messrs. D. P. McDonald, D. C. Holmes, and Prof. Young; Committee: Messrs. Geo. S. Corstorphine, L. de Villiers, J. Jervis Garrard, W. J. Gau, W. G. Holford, C. B. Horwood, E. Jorissen, T. N. Leslie, David P. McDonald, A. R. Sawyer, S. J. Shand, P. A. Wagner, and Paul Range.

* * * *

General Mining Group.

The latest batch of quarterly reports of the Albu group bring the results up to the end of the year 1914 with commendable promptitude. In the quarter ended the 31st December the Aurora West made a working profit of £13,241 17s., equal to 6s. 1·61d. per ton milled. The total expenditure was £39,016 19s. 11d., or 18s. 0·90d. per ton, and the gold account, including sundry revenue, was £52,258 16s. 11d. The profit was £430 4s. 3d. less than in the preceding quarter. The Meyer and Charlton's working profit was £60,869 17s. 3d., equal to 27s. 4·17d. per ton. The total working costs were £39,494 17s. 4d., or 17s. 8·93d. per ton, and the revenue from gold (including sundry revenue) was £100,364 14s. 7d. The profit is £1,732 19s. 1d. less than that for the preceding quarter. The West Rand Consolidated made a working profit of £330 3s. 10d. less than in the preceding quarter. It amounted to £20,160 3s. 3d., equal to 4s. 8·26d. per ton. The total working expenditure was £79,788 19s. 6d. (18s. 6·66d. per ton), and the total revenue £99,949 2s. 9d. The working profit at the Roodepoort United was £4,703 11s. 1d., equal to 11·04d. per ton—a decrease of £117 4s. 6d. as compared with the previous quarter. Working expenditure totalled £84,374 5s. 5d., or 16s. 6·04d. per ton, and the revenue from gold and sundry revenue amounted to £89,077 16s. 6d. A working profit of £30,822 1s. 6d., equal to 6s. 7·541d., was made at the New Goch £3,029 15s. 6d. less than the preceding quarter, due to a slight drop in the yield per ton of ore crushed. The working expenditure amounted to £63,190 19s. 11d., or 13s. 7·073d. per ton; and the revenue from gold (including sundry revenue) was £94,013 1s. 5d. At the Van Ryn Gold Mines Estate the revenue from gold and sundry revenue was £147,203 1s. 9d. Expenditure totalled £82,572 4s., equal to 14s. 1·52d. per ton, and the working profit was £64,630 17s. 9d., or 11s. 0·69d. per ton—£1,743 6s. 5d. less than in the preceding quarter, due to a slight falling off in the value per ton recovered. A gradual improvement has been evidenced in the company's native labour supply, and as a result an appreciable advancement in development operations may be looked for in the near future.

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British Steel and American Competition.

Out of a world's annual production of about 70,000,000 tons, measured in terms of pig iron, three countries—America, Britain, and Germany—have contributed well over 50,000,000 tons. In exports the proportion has been similar—these three countries doing 13,000,000 tons out of a world's total of 18,000,000. It is obvious, therefore, that if German competition ceases to be a serious factor as a result of the breaking of Germany's subsidy, bounty and credit methods, Britain and America stand to gain immensely. Which of these two countries, then, is in the best position to bid for the trade which our continental rivals and enemies will lose? This question opens out the great problem of American competition, and it is necessary to dip somewhat deeply into it. Just as there has been reluctance on the part of British capitalists in the past to invest in new steel works because German competition was so fierce, so now there may be some timidity owing to a fear that American competition may become overwhelming. In discussing the question, a writer in *The Engineer* shows that the three outstanding facts to-day, so far as the steel trade is concerned, are:—That the world's need for steel goods will be in no way permanently diminished, but probably increased, by the war; that the greatest steel dumper, Germany, is knocked out; and that in the new race between Britain and America Great Britain holds a combination of splendid natural advantages. Her only material defect is a deficient capacity to produce, which will doubtless be soon rectified.

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Held Over.

Owing to pressure on our space this week, articles have been unavoidably held over dealing with the Village Main Reef, the Luipaardsvlei Estate Co., Ltd., and the controversy regarding "Petrolex." Some opinions promised by experts regarding the last-named have failed to come to hand.

* * * *

President Wilson and "Safety First."

Among the features of a recent meeting of the American Mining Congress, according to an American exchange, was the reading of a letter to that body from the President of the United States, Mr. Woodrow Wilson. In these great days of world wars, the sending of such a letter is notable in itself. The work of the congress, in securing introduction of safer methods of mining, commend themselves to the President, whose letter is as follows:—

> "To the Members of the American Mining Congress: I regret exceedingly that, owing to the press of circumstances, it will be impossible for me to greet you in person at the seventeenth annual session of the American Mining Congress. I am well aware of the important part played by your great organisation in the creation of our Bureau of Mines, and am sure that the good work of that bureau in attempting better to safeguard the lives of the two million men employed in the hazardous mining and metallurgical industries will continue to redound to your credit as well as to the credit of the bureau itself. It will always be a tribute to your foresight and energy that this new federal organisation, in the short period of its existence, with the kindly co-operation of the states and their agencies, has been able by persistent and intelligent effort to turn an isolated local movement for greater safety into a great national movement for 'safety first,' and has already gone beyond the mining industry into every industry of the country. I venture to say that thousands of lives have been saved by that movement, and that many thousands more will be saved in the future. Gratifying as the results of this life saving campaign may have been, however, there is still vigorous work for your congress to do. I am informed that during the last year more than 3,000 men were killed and 100,000 injured in the mining and metallurgical industries of the country. At the same time, those in authority tell me that from their observation and experience one half of such deaths and three-fourths of such injuries may be regarded as easily preventable. I suggest this situation as an opportunity for further endeavour on your part to cut down this excessive toll of death and of injury. I can assure you of the fullest co-operation of all the proper governmental agencies, also of my earnest desire for your active and continued assistance."

TOPICS OF THE WEEK.

LATEST "SAFETY FIRST" ACTIVITIES.

THE excellent progress being made by the "Safety First" movement on the Rand has lately manifested itself in several directions. Through the courtesy of the Rand Mutual Assurance Co., Ltd., whose officers welcome publicity, we are enabled this week to make a brief "progress report" on the latest activities of the indefatigable Prevention of Accidents Committee of that body, which, as is well-known, has the matter in hand. This Committee, it should be said at once, acts in complete accord with the Council of the Association of Mine Managers, and much of the success that has already attended its efforts is due to the whole-hearted co-operation of that body. In the first place, the practice of circularizing the mines from time to time in regard to new ideas and devices is being continued and extended. "Safety First" suggestions capable of useful application to the peculiar conditions of the Rand are gladly received and given every consideration. The system of lectures on safety measures for Rand mines, so successfully inaugurated last year by Mr. A. M. Archbold, the Department Inspector of Mines for the Krugersdorp district, will during the present year be extended to the East Rand, and the services of a highly-qualified lecturer have been secured. Increased and minute attention has been given to the important subjects of gassing, packing of detonators, and the abuse of intoxicants, and the results of these investigations have been communicated broadcast on the Reef. The last-named subject, it need hardly be said, is a most delicate one. The mere whisper of any attempt by well-intentioned reformers to interfere with the "poor man's beer" have caused tumults in industrial centres before now. Nothing so crude is, of course, under discussion in the present instance. A simple, scientific reminder of the effect of alcohol on human efficiency is all that has been attempted by the undoubted authority whom the Committee has consulted in this matter. As will be seen from the article printed elsewhere in this issue, he has stated the facts very briefly and clearly, and no one of us whose lot has been cast amid mining fields, with their added attractions to every cheap form of anodyne, will question his conclusions. In this connection we may be permitted to offer a suggestion. Some years ago, moved by his enthusiasm for the cause, General Sir Reginald Hart, lately Commander-in-Chief in South Africa, presented at his own expense to every regimental and garrison institute of the British Army a copy of the famous book by Sir Victor Horsly on "Alcohol and the Human Body." The effect of that action, we have been told, was enormous, and we may commend the example to any of our philanthropically-inclined mining men desirous of benefitting their fellows. The extension of the practice of supplying free coffee to the men coming off shift, which was begun at the Nourse Mines is a direct outcome of this movement, and we believe it is only a question of time before it becomes general on the mines of the Rand. Not content with thus publicly taking the "Sober First" movement under their wing, the "Safety First" people have also extended their powerful influence to embrace the "First Aid" propaganda on the Rand. "Foolproof" instructions in "First Aid" are now being compiled for them by a leading medical expert, and a pamphlet containing all the elementary knowledge requisite to enable the least intelligent worker to render "First Aid" will be distributed throughout the mines. The aim of the Prevention of Accidents Committee will doubtless be to work in harmonious co-operation with the existing bodies, the St. John Ambulance and the S.A. Red Cross Society, which include the "First Aid" movement in their province. Not less interesting and valuable is the publication and circulation by the Committee of a pamphlet of extracts from the annual report of the Department of Mines and Industries for the year 1913, on the express recommendation of the Council of the Association of Mine Managers of the Transvaal. The extracts, which deal with accidents in the Transvaal mines, especially the gold mines, are selected from the reports of the Government Mining Engineer and the Inspectors of the

Johannesburg, Germiston, Boksburg, and Krugersdorp districts, and contain a careful analysis of the accidents which have occurred during the year under review, as well as defining their causes. It is felt that this valuable information might escape a considerable proportion of the officials on the Transvaal mines unless placed before them in a compact and accessible manner, on account of the voluminous nature of the annual report and the expense of procuring a copy. It is hoped that the officials will appreciate that this pamphlet is not issued in a spirit of criticism, but that the intention is to render assistance to them in their strenuous endeavours to reduce the accident rate on the mines. In several other important directions, which we are not yet at liberty to discuss, the Committee is pursuing its good work, but enough has been cited to illustrate the steady, all-round character of the progress being made. Several of our friends in the Mines Department and on the mines have welcomed the publication in our columns of the informative paper recently read by Mr. Edwin Higgins before the A.I.M.E. on the safety movement in the Lake Superior iron mines. There, as here, the bulk of the cost of the safety work has been and is still borne by the mining companies. In the main, as the author shows, their work has been to provide protective devices in and about the mines, and to educate the miners, by means of rules and regulations and various other methods, so as to enable them to protect themselves from injury. These objects seem easy of accomplishment, but there are obstacles of various kinds continually arising to hinder progress toward the desired end. Some of the most serious factors, most of which still exist to a greater or less extent, no less on the Rand than in America, are the prejudice of the old-time miner or "boss" toward safety regulations; carelessness and lack of interest in safety work on the part of miners, and even the "bosses"; and at times the scarcity of labour, which necessitates the employment of less skilled and oftentimes ignorant men. In the States, as on the Rand, the greatest problem to-day is not to secure knowledge of how safety work should be conducted, and what protective devices to use, but how to get the miner to use these methods and devices. Probably not 10 per cent. of the miners, if subjected to an examination, would show even a passing knowledge of the contents of the books of rules and regulations. Safety devices, provided at great expense, are often found removed from their places, or disregarded entirely. Finally, there, as here, the first problem of the mining companies was to provide for an organization to carry on the safety work, then to devise means of protecting the miner and of educating him and securing his co-operation in the prevention of accidents. Comparing the methods and results so far achieved on the Rand, it may fairly be claimed that the promoters of the movement have been singularly successful. How successful may be shown to some extent by comparing the number of accidents on mines in 1913 and 1914. In 1913 the total number of separate accidents in the mines of South Africa (the Rand furnishing the bulk) was 3,325. In the year 1914, according to the Mines Department returns issued this week, the total was only 2,768. Again, the total number of those killed, white and black, by mine accidents in 1913 was 1,016; in 1914 it fell to 769. The total number of those injured, white and black) by mine accidents in 1913 was 2,866; for 1914 it was only 2,385. The figures for 1913, it will be remembered, showed an improvement on those for 1912, but not so marked as that shown by 1914 over 1913. To what extent the improvement is due to the suspension of work at the diamond mines cannot yet be ascertained from the figures available. Credit, however, for the showing and tendency indicated for the Rand must, of course, be given to all concerned—mine inspectors, mine managers and men. And all classes, we believe, will acknowledge how much of their success has been due to the magnificent backing and encouragment afforded by the Prevention of Accidents Committee of the Rand Mutual.

MINERAL RETURNS FOR 1914.

THE detailed returns issued this week by the Mines Department and by the Chamber of Mines provide us with the most complete and authoritative summary and analysis of the mineral production of the year yet available. According to the Chamber of Mines' returns, the total (differing slightly from that of the Department) output of gold from the Transvaal last year was valued at £35,588,075. Out of this no less than £22,654,845 represented working costs, the balance, £11,979,329 being working profit. Of that working profit the sum of £8,404,060 was distributed in dividends. For 1913 the sum so distributed was £8,596,532. Compared with 1913, some interesting changes are shown in the figures for Transvaal gold mines. Thus the total tonnage crushed in 1914 was 26,369,946 as against 26,267,840 for 1913. The number of stamps employed in 1914, strangely enough considering the new batteries, was less, being only 9,757, as against 9,912, though the duty per stamp was better, being 8·86 as compared with 8·71 in 1913. The number of tube mills at work, however, rose last year to 294, an increase of seven on 1913. Though the number of tons crushed was actually more than for 1913, the total yield, owing to the lower grade of ore crushed, was less by £1,768,965—a drop of 1s. 4d. per ton milled. Fortunately, it was possible to reduce costs by tenpence per ton milled, so that the profit was only reduced by sevenpence per ton milled. The figures for the whole Transvaal reflect very clearly the changes in the figures for the Rand proper. Adding the small gold output from the rest of the Union outside the Transvaal, we get a total of £35,664,230 as the total gold output of the Union. With the Rhodesian output, the total from South Africa will be over £39,000,000. Reverting to the Union, we find the value of the mineral production swelled by the addition of silver £102,433, coal £2,225,041, and base minerals, other than coal, £1,147,659, making a grand total of £39,139,363 as the value of the mineral output of the Union in 1914, exclusive of diamonds. White labour employed on the Rand gold mines increased from 20,715 in January, 1914, to 22,324 in July, its high water mark, and fell slightly in keeping with the falling off in the native labour force, to 21,837 in December. The effect of the war on prospecting is shown by the drop in claim licences held at December 31 as compared with June 30. Prospecting permits held at December 31 were only 373, as compared with 475 at June 30. Prospecting claims held at December 31 were only 62,245, as against 67,848 at June 30; and base metal claims held at the end of the year had fallen to 26,896 from 35,701. How far this regrettable reflection of prospecting apathy is due to a refusal of the Minister of Mines to forego prospecting claim licences in war time we do not know. The Minister of Mines, doubtless, can be trusted to do the right thing by prospectors and claimholders hard hit by the war. Meanwhile we may take comfort from the globular output figures quoted which reflect an industrial position healthy despite the many adverse influences of this unprecedented time.

Bwana M'Kubwa Copper Mining.

After full consideration of the increased costs in sea freights and otherwise, and of the fall in price of copper, together with the state of affairs generally brought about by the war, the directors of Bwana M'Kubwa decided that work at the mine should be suspended for the present. The works were consequently closed down on September 10. During the year prolonged negotiations were conducted by the board with a group of continental capitalists for the purpose of investigating and, if approved, adopting a special process for the recovery of the copper from the low-grade ores and erecting at the mine a plant capable of treating 500 tons of ore daily. At the outbreak of the war no final arrangements had been arrived at, and further negotiations with the capitalists referred to necessarily ceased. Since the outbreak of the war the board have arranged with the American company which owns the process above referred to to demonstrate their process on a working scale at this company's Battersea works. These operations have not yet been completed, but it is anticipated that the results will be available at an early date.

THE COMPLETE DIVIDEND RECORD FOR 1914.

Full List of Declarations by Land and Finance, Rhodesian, Colliery, Copper, Tin, Diamond and Miscellaneous Companies.

In addition to the dividends of gold mines for 1914 recently detailed in our columns, the following exhaustive list may also be of value for record purposes:—

DIAMONDS.	When Declared.	Cash Distributed.	Rate per Cent.	Per Cent. for the Corresponding Period.
Blaauwbosch Diamonds ..	Mar. 4	£4,900	20	20
,, ,,	June 3	4,900	20	20
De Beers	June 26	500,000	20	40
Koffyfontein Estates ..	June 30	4,260	15	15
Kolmanskop Diamond ..	Mar. 31	22,500	20	20
New Jagersfontein ..	Mar. 25	106,250	12½	25
New Vaal River Diamond..	Dec. 22	8,444	5	10
Premier Diamond ..	June 19	80,000	200	400
Total		£731,254		

BANKS.	When Declared.	Cash Distributed.	Rate per Cent.	Per Cent for the Corresponding Period.
African Banking Corporation	June 4	£24,000	4	4
	Dec. 15	12,000	2	4
Natal Bank	Jan. 9	20,000	4	4
National Bank	April 17	70,500	3	3
,,	Nov. 13	70,500	3	4½
Netherlands Bank	June —	9,600	4	4
Standard Bank	Feb. 25	108,397	7	7
,,	Aug. 26	108,397	7	7
Total		£423,394		

COPPER.	When Declared.	Cash Distributed.	Rate per Cent.	Per Cent. for the Corresponding. Period.
Cape Copper	June 3	£15,000	2½	3¾
Namaqua Copper	Mar. 12	23,582	12½	22½
Total		£38,582		

LAND AND FINANCE.	When Declared.	Cash Distributed.	Rate per Cent.	Per Cent. for the Corresponding Period.
African City Properties ..	Mar. 30	£11,016	5	5
Auckland Park Real Estate	June 2	5,550	3¾	—
Central Mining	July 13	127,500	2½	2½
Consolidated Gold Fields	Feb. 5	100,000	5	5
Consolidated Mines ..	Mar. 31	27,625	5	10
Delagoa Bay Development.	Nov. 7	4,010	3	3
Elandsfontein Estate ..	Feb. 19	1,500	5	—
Glasgow and South African.	Sept. 14	750	5	4
Henderson's Consolidated	Mar. 19	4,458	2½	—
Johannesburg Consolidated	June 20	197,500	5	5
Natal Land	Mar. 19	15,315	4½	4
,,	Sept. 19	8,508	2½	2½
New African	July 4	14,188	5	—
New Era	Dec. 18	10,000	10	10
New Transvaal Gold ..	June 24	4,750	10	10
Rand Mines	June 16	584,647	110	110
,,	Dec. 14	478,349	90	110
Real Estate Corporation...	Feb. 13	3,750	2½	2½
,, ,,	June 6	7,500	5	5
S.A. & General Investment	Mar. 31	6,000	3	3
,, ,,	Oct. 20	4,000	2	3
South West Africa.. ..	May 9	87,500	5	5
Total		£1,704,416		

TIN.	When Declared.	Cash Distributed.	Rate per Cent.	Per Cent. for the Corresponding Period.
Rooiberg Minerals	June 18	£13,500	7½	20
,, ,,	Dec. 16	9,000	5	10
Zaaiplaats Tin	Jan. 23	15,000	25	25
,, ,,	April 15	12,000	20	20
Total		£49,500		

COLLIERIES.	When Declared.	Cash Distributed.	Rate per Cent.	Per Cent. for the Corresponding Period.
Apex Mines	Dec. 16	£22,500	7½	—
Breyten Collieries	June 30	4,500	5	—
,,	Dec. 16	2,250	2½	5
Cassel	Dec. 30	10,000	5	5
Clydesdale Collieries ..	July 17	9,000	5	5
,, ,,	Feb. 21	7,675	5	5
Dundee Coal	June 24	7,675	5	5
,,	Dec. 30	11,512	7½	5
East Rand Coal	Dec. 30	2,500	5	5
Elandslaagte Collieries ..	June 23	4,125	2½	2½
Glencoe Collieries	June 20	6,250	2½	2½
,,	Dec. 23	3,125	1¼	2½
Kroonstad Coal	Sept. 26	8,287	7½	5
Middelburg Steam Coal ..	May 6	3,541	3¾	3¾
,, ,,	Dec. 16	3,541	3¾	3¾
Natal Navigation Collieries	June 18	15,487	3¾	3¾
,, ,,	Dec. 30	15,487	3¾	3¾
Trnsvl. & Del. Bay Invstmt	Nov. 24	32,375	17½	17½
Transvaal Coal Trust ..	June 12	40,932	7½	10
,, ,,	Dec. 18	47,754	8¾	7½
Tweefontein Colliery ..	Mar. 19	8,023	17½	8¾
,, ,,	Dec. 16	2,750	6	7½
Wankie Colliery	Mar. 18	20,261	10	7½
,,	Nov. 27	30,394	15	10
Welgedacht Exploration ..	Nov. 23	7,837	5	—
Witbank Colliery	Feb. 13	26,250	12½	15
,,	Sept. 7	26,250	12½	10
Total		£380,281		

RHODESIAN.	When Declared.	Cash Distributed.	Rate per Cent.	Per Cent. for the Corresponding Period.
Bechuanaland Exploration	June 27	£8,000	4	4
Bechuanaland Trading ..	Dec. 21	1,319	2½	2½
Charter Trust	Jan. 29	6,250	1¼	3¾
,,	June 18	10,000	2	3¾
Crescens (Matabele) ..	Oct. 19	3,635	5	—
Eldorado Banket	June 10	30,000	10	15
,,	Dec. 23	22,500	7½	15
Gaika Gold	Jan. 22	13,674	5	—
,,	June 18	13,674	5	—
,,	Dec. 17	13,674	5	—
Globe & Phoenix	Jan. 5	40,000	20	35
,,	Mar. 30	70,000	35	35
,,	July 9	60,000	30	35
,,	Oct. 5	60,000	30	35
Lonely Reef..	Jan. 15	27,100	10	10
,,	May 20	27,100	10	10
Rezende Mines	May 18	8,881	7½	7½
,,	Sept. 17	7,401	6¼	7½
Rhodesia Copper	July 8	7,914	3	—
Rhodesia Railways Trust..	June 11	50,144	2½	—
Selukwe Columbia	Nov. 18	21,037	15	—
Total		£502,303		

MISCELLANEOUS.	When Declared.	Cash Distributed.	Rate per Cent.	Per Cent. for the Corresponding Period.
African Lakes Corporation	Oct. 15	£11,719	7½	10
African Produce	Feb. 7	1,625	5	5
,, (a). ..	July 14	2,117	5	5
B.S.A. Explosives	Mar. 9	49,500	7½	7½
Cape Electric Tramways ..	Dec. 2	12,280	2½	5
Cold Storage Trust ..	Nov. 20	7,725	1¼	2½
E. W. Tarry & Co., ..	Dec. 22	3,750	2½	5
Hulett, Sir J. L., & Sons ..	Mar. 31	25,000	5	—
,, ,,	Nov. 3	25,000	5	5
Imperial Cold Storage ..	June 15	8,615	2½	—
Kimberley Waterworks ..	April 14	15,750	5	3¼
,, ,,	Oct. 17	7,875	2½	2½
Natal-Zululand Railway ..	Mar. 7	1,081	1	1
,, ,,	Sept. 26	1,081	1	1½
New Transvaal Chemical	Jan. 10	12,000	8	18
Otavi Mines	July 23	90,000	45	40
Pretoria Portland Cement	June 19	22,500	15	20
South African Lighting ..	May 6	4,950	5½	5½
,, ,,	Sept. 24	3,150	3½	3½
Stuttaford & Co.	June 27	5,403	3	3
,,	Oct. 20	7,204	4	6
Tongaat Sugar	Oct. 10	14,800	10	15
Union-Castle	May 19	61,600	3½	3¾
,,	Sept. 30	44,000	2½	3
Total		£438,725		

BREWERIES.	When Declared.	Cash Distributed.	Rate per Cent.	Per Cent. for the Corresponding Period.
Ohlsson's Cape Breweries ..	June 12	£24,000	8	8
South African Breweries ..	June 19	96,527	10	10
,, ,,	Dec. 2	48,263	5	7½
Total		£168,790		

Golden Hills Mines.

The Golden Hills Mines, Ltd., a company which is working the property known formerly as the Blaauwbank Gold Mines and more recently as the North Bonanza Gold Mines, proposes, it is understood, to conduct operations on a more extensive scale than has been done there in the past. With this object in view it has acquired the plant, including a 20-stamp battery, of the West Rand Unified, and will thus be in a position, when the removal is effected, of dropping 30 stamps. The property is under the management of Mr. Roberts and is situated from three to four miles from Blaauwbank Station. Two shafts, a vertical and an incline, have already been sunk.

THE YEAR WITH THE WOLHUTER GOLD MINES.

Improved Position and Prospects—Increased Profits, Tonnage Milled and Ore Reserves.

The annual report of the Wolhuter for 1914 shows that the tonnage milled during the past year shows an increase of 41,750 tons over the previous year, it being 382,700 tons, whilst the average profit per ton has decreased from 8s. 2·1d. to 8s. 0·5d., the total profit being £153,858 against £139,399 for the previous year, or an increase of £14,459 in the total profit obtained. The payable ore reserves show an increase from 784,100 tons, assaying 6·1 dwts. over 51·5 inches, to 999,400 tons, assaying 5·9 dwts. over 58·4 inches. The appropriation account may be summarised as follows:—Balance brought forward from 31st October, 1913, £38,211; profits earned during the year, £153,858; sundry revenue, £2,262—total, £194,332; less auditors' fees and profits tax for previous year, £10,955; directors' extra remuneration in accordance with the company's articles of association, £1,000; expenditure on capital account, £19,574; fourth annual instalment paid to Government on account of purchase price of mineral rights under bewaarplaatsen and water-rights, £7,931; contribution to miners' phthisis compensation fund and English income tax, £7,834—£47,295; total, £147,036; Dividends Nos. 13 and 14 declared and paid, £107,500; leaving a balance of £39,536. The capital expenditure for the past year has been as follows:—Buildings, £394; machinery and plant, £7,969; shafts, £11,034; fencing, £51; shares in Co-operative Smelting Works, Ltd., and deposit in respect of native complement, £225—£19,674; less livestock, vehicles and harness, written off, £100; total, £19,574. On the 30th April, 1914, the directors declared an interim dividend, No. 13, of 1s. 3d. per share (6¼ per cent.) for the first half year; and on the 31st October, 1914, they declared a further dividend, No. 14, of 1s. 3d. per share (6¼ per cent.) for the second half year, making in all 12½ per cent. for the year. The consulting engineer, Mr. D. Wilkinson, writes:—

I have much pleasure in confirming your manager's report for the past financial year, and in drawing attention to the more salient details. The following is a comparison of the yield, costs, and profits for the last two years:—1913: Tons milled, 340,950; yield per ton, 26s. 5.0d.; costs per ton, 18s. 2.9d.; profit per ton, 8s. 2.1d.; total profits, £139,399. 1914: Tons milled, 382,700; yield per ton, 25s. 0.4d.; costs per ton, 16s. 11.9d.; profit per ton, 8s. 0.5d.; total profits, £153,858. The number of feet crosscut, driven, raised and sunk was 15,410, as compared with 10,849 during the previous year—an increase of 4,561 feet, or 42 per cent. This development resulted in the exposure of 528,700 tons, of which 437,700 tons, or 82.8 per cent., is estimated as profitable under present conditions, having an average assay value of 6.3 dwts. over an estimated stoping width of 58.5 inches. The above working costs of 16s. 11.9d. per ton include the cost of this development, and are more creditable than appears at first sight. The policy of pushing ahead the development with the object of increasing the ore reserves will be continued this year, particularly in the eastern section, where the major portion of the remaining unexplored area is situated. During the past year 426,390 tons were mined, of which only 231,140 tons, or 54 per cent., was obtained from the ore reserves. The small proportion mined from the ore reserves, together with the large exposures by development, have resulted in an increase of 215,300 tons in the reserves, the estimated total now being 999,400 tons, of an average assay value of 5.9 dwts. over 53.4 inches, compared with 784,100 tons of an average assay value of 6.1 dwts. over 51.5 inches, as at October 31st, 1913. The capital expenditure for the year was £19.449, showing a decrease of £9,723 as compared with 1913, the main items being the sinking of the auxiliary shaft, the installation of a 40-drill compressor, the electrification of the mill, the completion of the slimes tank, and the enlargement of the sands tanks. In order to make the best use of the plant it has been decided to use the present boiler power for the new steam compressor, and to purchase electric power from the Victoria Falls and Transvaal Power Company for the running of the mill. As a result of this arrangement we shall be able to maintain a good load factor, thereby obtaining our purchased power at the minimum cost. The sinking of the east auxiliary incline will be completed during this year, together with the stations on the 23rd and 24th levels, and the capital expenditure for this year will show a considerable decrease below that of the past year.

The manager, Mr. J. E. McGuire, writes:—

During the year the following alterations and additions have been made to the plant:—A 40-drill steam-driven Bellis and Morcom compressor has been erected in the mill engine room. In order to use the present boiler power for this compressor, it was decided to substitute electric power, purchased from the Victoria Falls Power Company, Ltd., for much of the electric power generated on the mine. Considerable progress has been made with this work. The four new slimes tanks and the change house at the east shaft, under erection last year, have been completed.

INVESTORS' DIARY.

FORTHCOMING COMPANY MEETINGS.

Feb. 26.—Southern Freeholds; South Deeps; East Rietfontein Syndicate.
March 26.—Jupiter G.M. Co.; Simmer Deep.

THE ALCOHOL QUESTION ON THE RAND.

Consumption Hostile to Industrial Efficiency—Need for Education Against the Practice—Free Coffee and Other Substitutes—"Sober First" Movement Part of the "Safety First" Movement.

THE following memorandum has been prepared for the "Safety First" Committee by Dr. A. J. Orenstein, the well-known American expert, who is now Superintendent of Sanitation to the Rand Mines, Ltd.:—

In pursuance of instructions from the Committee, I beg to submit herewith a memorandum on the alcohol question as it relates to industries:—I wish to state at the outset that I am compelled to confine myself to a very brief, and consequently, incomplete statement of this case, because to cover in any adequate manner the question in all its ramifications throughout Europe and America, and the mass of literature which has been written, would require far more time than either I could devote to the writing or the members of the Committee to the reading.

EUROPE.

The beginning of the anti-alcohol movement from the biological standpoint, that is to say, purely from the standpoint of the physical well-being of the race, as distinct from the general objection to alcohol on sentimental and religious grounds, can be dated for Europe from the publication of Prof. Von Bunge's "Die Alkoholfrage." A propaganda from the standpoint of the large employers of labour was taken up in 1895 by Mr. Georg Asmussen, the Chief Engineer of the Blohm & Voss Docks in Hamburg, who was the real organiser of German movement. Within a very few years, following upon the brilliant researches of the Heidelberg School of Psychologists led by Kraepelin, practically all the leaders of scientific thought in Germany accepted the hypothesis that alcohol even in moderate quantities exerts a deleterious influence upon the human body. Within the past three decades a number of Conferences for the discussion of the alcohol question have been held in Europe, beginning with a very poorly attended one at Antwerp in 1885. These Congresses have become more and more important, until the last one, held in The Hague in 1911, was one of the great scientific events in Europe. Among the opponents, on scientific grounds, of the use of alcohol are some of the brightest intellects in the scientific world of all the countries of Europe. The list of signatures attached to the famous International Appeal addressed to the United States on behalf of the threatened Maine prohibition law reads like a directory of the famous scientists of Europe. Among the hundreds of names appear such internationally famous ones as Dr. Klaus Hansen, Prof. Kraepelin, Judge Bauer of Munich, Prof. August Forel, Prof. Von Bunge, Dr. Bertholet, Dr. Jacques Loeb, Krohn, Prof. Fick, Prof. Max Kassowitz, Dr. Frohlich. As a result of the various methods of propaganda and education, the new Germany of industrialism took up very seriously the study of the question of alcohol consumption as it is related to industrial efficiency, and very soon such striking figures as the following were compiled. In Munich it was shown that the percentage of accidents due to alcoholism, according to the days of the week, was as follows:—Sundays and holidays, 15.9; Mondays, 17.3; Tuesdays, 15.6; Wednesdays, 11.3; Thursdays, 12.0; Fridays, 14.3; Saturdays, 13.3. In one German city, 1,143 accidents were distributed as follows:—Sunday, 502; holidays, 126; Monday, 182; Tuesday, 95; Wednesday, 67; Thursday, 62; Friday, 82; Saturday, 94. It was shown by carefully controlled experiments repeated a number of times that, among other effects, alcohol impairs co-ordination, and that this impairment proceeds in an order inverse to the development of the nervous centres, that is, the highest centres become impaired first and the lowest last. To put this into perhaps more easily understood language. What takes place is that the eye or the ear receive some signal which requires quick response from some other part of the body in order to avoid a threatening danger. This response does not come so quickly in one under the influence of acute or chronic alcohol poisoning as it does in one whose system has not been subjected to the influence of this drug. It was shown that the quantity of alcohol which can produce impairment in co-ordination is a very small one, and that very definite impairment can be produced in adults by the taking of about 1 oz. of cognac or about a quart of ordinary beer. It was shown also that this amount of alcohol will seriously affect the marksmanship of riflemen. In six series of tests carried out in Germany it was shown that without taking a dose of alcohol, corporals averaged 19.22 points, privates 15.24 points. In seven series with alcohol, corporals 17.95 points, privates 11.34 points. In quick firing, the results were even more striking. Before the alcohol dose was taken, there were seven misses; when it was taken, 27 misses; and later, after the alcohol effect had worn off and, probably, because of the proficiency acquired in the previous tests, the misses were reduced still further to 4.6 Experiments were carried on with type-setting, typewriting, mental work, such as adding columns of figures, and many other ways too numerous to discuss here, and all without exception, when properly controlled, have shown that alcohol exercises a deleterious influence on the power to think clearly and rapidly, on co-ordination and on nervous stability. And so the question was squarely put to the German manufacturer, mine-owner, etc. What should be done to increase the efficiency of his working forces and thus secure an advantage in the close race of international competition? It was realised at the outset, I presume, that prohibition was a difficult matter to bring about, and that the lines on which success could be most hopefully anticipated were those of education and substitution. It was along these lines that the fight against alcohol among the industries has been conducted. The great temperance society known as the Good Templars has been assisted in every way in its work. Insurance societies, sick benefit societies, trade unions, have all been enlisted in the crusade, in fact, a large number of German trade unions, especially those of the building trades, and a number of working men's mutual insurance societies prohibit the use of alcohol to their members. The most progressive working-men's papers have published series of articles condemning the use of alcohol. Thousands of copies of a special bulletin on alcohol issued by the Imperial Health Bureau have been distributed by the working-men's insurance organisations. The sick benefit societies of Westphalia print anti-alcohol matter on their hundreds of thousands of receipts. In the Rhineland there is a special department to deal with alcoholics. In Hesse there is a special alcohol section to the Anti-Tuberculous travelling exhibit, and the popular literature accompanying this exhibit lays special stress on the connection between alcohol and tuberculosis. The Imperial Commission of the Austrian State Invalid Insurance has distributed 1,000,000 copies of Dr. Froehlich's essay—"Alcohol as a Cause of Sickness." But it was also realised that, in addition to education, substitution was a very important matter, and along this line a great deal has been done among the great industries of Germany. Money has been lent to the Good Templars for the establishment of their milk and coffee booths. The Directorate of the Rochling Steel Works gives a progressive premium to employees joining the Good Templars. Krupps have forbidden since 1910 the sale of beer in their steel works, and have opened milk booths. In the machine shops of Ludwig Loewe, in Berlin, 452,000 quarts of tea were served free to the working men in 1911. The Berlin City Gasworks, the mining companies of the Rhineland, the iron and steel works of Upper Silesia, the Railways of Baden, the Imperial Canal of Keil, all the Berlin surface and subway railways, the railways of Saxony, the Vienna Street Railways, the Bavarian State Railways, have all carried on an active propaganda against alcohol, which in some instance has extended to an absolute prohibition to employees of the use of alcohol, and in all instance has been accompanied by the provision of coffee, tea, milk, or lemonade, either free or at a nominal cost. In one of the great iron and steel works of Upper Silesia, the consumption of beer, which in 1909 was 147,000 barrels, came down to 14,500 in 1911. In one of the mines of the Dortmunder Union, the consumption of beer fell from 1,700 hectolitres in 1907, to 700 in 1911.

AMERICA.

The anti-alcohol movement among the industries of the United States of America is only a few years old, and dates back to the great movement inaugurated by Taylor, and generally spoken of as "Efficiency Engineering." It has grown by leaps and bounds. Again it was shown that Monday is the accident day. It was shown by the study of insurance statistics that from 7 to 43 per cent. of accidents are due directly or indirectly to drink. It was shown that one death in every twenty in the United States is due directly or indirectly to alcohol, that is to say, 65,897 deaths per annum. Very soon the knowledge brought an attempt at remedy. As one writer on this question put is: "The evidence which has been gathered in the past calls loudly and clearly for sober men in the mills. 'Safety First' is no longer the slogan—but 'Sober First,' and then safety will be assured. Men who run dangerous machinery to-day must have steady nerves. They risk their lives, their fellow workmen's lives, their employer's property, and in case of accident their employer's money in compensation. It is the drink or the job." Once having realised that alcohol and efficiency were incompatible, the American employer of labour soon took steps to rid himself of alcohol. How far he has gone is perhaps indicated best by the Federal Bureau Investigation of the attitude of employers towards the use of intoxicating liquors by employees. Out of 7,000 employers investigated, over one-half reported that they required abstinence. The following notices are characteristic of the attitude of the American large employer: The American Car and Foundry Co., Berwick, Pa. "The meetings of Dr. Stough were held in the end of October and the beginning of November. Since that time it is asserted accidents have been reduced 34 per cent. The output in the passenger car department has been increased from 1½ cars a day to 2 cars with the same force employed. The bank deposits in the six weeks following the meeting were 80,000 dollars larger than in any other six weeks period." The Delaware, Lackawanna, and Western Railroad Co., Scranton, Pa. "In furtherance of the objects of the several Federal and State 'Hours of Service' laws, employees in engine, train, yard, and station service are prohibited from using their time while off duty in a manner that may unfit them for the safe, prompt, and efficient performance of their respective duties for the Company. They are strictly enjoined and required to use their time while off duty primarily for obtaining ample rest. The use of intoxicants while on or off duty, or the visiting of saloons or places where liquor is sold, incapacitates men for railroad service, and is absolutely prohibited. Any violation of this rule by employees in engine, train, yard, or station service will be sufficient cause for dismissal." Almost all of the other railroads have issued similar notices. The Philadelphia Quartz Co., the largest in Pennsylvania, announced last February that it would increase by 10 per cent. the wages of all those employees who would sign the temperance pledge. There was no compulsion about it, but all the 300 men and boys signed up. The manager of the plant says that it is only common sense to state that a strictly sober man is worth more to his Company, and that the firm expects to be more than repaid by the improvement in the service it will get from sober men. Another firm, one of several which might be cited, the United States Steel Mills, in March last issued a special order to the effect that all promotions hereafter, of whatsoever character, will be made only from the ranks of those who do not indulge in the use of intoxicating drinks. In the very same month the Great Northern Railroad notified the town Garretson, South Dakota, that unless it voted out the saloons and kept them out, the Railroad would have its division headquarters moved to an adjoining dry town. Many employers have warned their employees that the signing of a petition for the establishment of a saloon will be considered an act inimical to the factory employing them. A recent writer in one of the American publications says: "I have before me a letter with the names of several large factories employing thousands of men, which provide milk for their employees. The milk is sold at cost. Saloons which provide hot soup as an inducement for workmen to drink their beer can be met on their own ground by substantial meals served in the neighbourhood of the works without intoxicating liquors." To sum up, the position in both Europe and America is:—(1) That the consumption of alcohol is inimical to industrial efficiency; (2) that the consumption of alcohol must be combatted by intelligent effort on the part of employers of labour; (3) that this effort can be exercised most efficiently in two directions: (a) Education of the working men and the public in general; (b) substitution of non-alcoholic drink having a stimulating and nutritive value, and thus preventing to a certain extent the use of alcohol. The last measure is based on the fact that the majority of men taking a drink do not do so because of strong preference for alcohol, but because their system craves a stimulant of some sort after severe exertion, and that they will take the stimulant which is most convenient to get.

GOLD AND THE WAR.

World's Output for 1914 About £91,000,000—Reduction of World's Total—Comparative Gold Reserves of the Nations—Reduced Indian Demand—How the Rand Has Augmented the Bank of England Reserve.

In their annual bullion circular, Messrs. Samuel Montagu remark that modern science has so improved methods of transport and communication by post and telegraph, that the whole mercantile world is interlocked, and the shock of the colossal European war put a sudden strain upon the finances of neutrals, often no less, and in some cases more severe, than that felt by combatants themselves, so like one vast neighbourhood has the financial world become. The currency system of Great Britain passed through this fierce ordeal with complete success. On no occasion did gold fail to be readily available on the presentation of currency notes, notwithstanding that the stock of gold at the disposal of the Bank of England was extremely small, compared with that of other European State banks. On 30th July, the Bank of England gold reserve was announced as about £36,671,405, and on 7th August as about £26,041,070, but in less than a month—namely, on 3rd September—the total reached £47,051,075, and subsequently £71,900,000 and upwards, in addition to the £16,500,000 in the special gold reserve. The bulk of the increase between 7th August and 3rd September was represented, not by gold purchased and deposited in the vaults of the bank here, but but by gold deposited, for account of the Bank of England, with certain South African banks at Pretoria, and with the Canadian Minister of Finance at Ottawa, against disbursements made in London. A similar arrangements was extended to New Zealand, India and Australia. In this way any risk attaching to transit to this country was entirely obviated.

EXCHANGE FLUCTUATIONS.

The exchanges fluctuated widely in the first few days of the crisis. Those with Paris and with New York deserve special mention. Remittances from London to Paris commanded a premium of nearly 3 per cent. over the par of exchange, while remittances from New York had to suffer a discount of 13 per cent. under the par and later on as much as 33 per cent. When it is recalled that the normal stock of gold in the Bank of England is only about £40,000,000, compared with £260,000,000 in the Treasury of the United States of America, the enormous fall in the United States exchange appears to call for elucidation. It is not the mere existence of huge stocks of gold, but their effective use that ensures a stable exchange in a time of crisis. The war created not only a gold but also a credit crisis. In the case of no country was the stability of exchange on the advent of war shown so conclusively as in the case of India. The criticism levelled against the currency system of that empire has been dealt with lately by the report of a Royal Commission, but the manner in which that system met the world-wide financial crisis incident upon the war dealt the critics a still more shattering blow. The circulation of silver rupees to the face value of perhaps £140,000,000 has been maintained easily, within about $1\frac{1}{8}$ per cent. of the par—namely, 15 rupees to the sovereign, notwithstanding events capable of exerting an abnormal strain. Ordinary movements of trade, etc., often suffice to cause the exchange to fall $\frac{1}{2}$ per cent. under the par.

STATE GOLD HOLDINGS.

One important fact emerges from the financial position created by the war. The holdings of gold by the State banks of combatant nations on the Continent have practically ceased for the time being to exercise their customary function as reserves against the issue of notes. The large increase of the gold holding of the German Reichsbank during the last two years thus acquires grave significance now that its gold reserves may be destined to become the sinews of war. A considerable portion of the gold added to the Reichsbank gold reserves since the commencement of the war consisted of the contents of the war chest held at Spandau. The control exercised by the Government over the use of gold is shown by the order issued by the Bundesrath prohibiting the export of gold under a penalty of one year's imprisonment and a fine of £250. This accumulation of gold is not being released for ordinary foreign banking purposes, but is being held presumably for war finance alone. As a consequence Holland for many weeks past has refused to accept German currency except at the heavy discount of between 7 and 8 per cent. In contrast to this M. Ribot, the French Minister of Finance, in his statement before the Budget Committee, on 18th December, used these words with regard to the Bank of France:—"Never had its notes enjoyed greater credit both in France and abroad. They were everywhere at a premium, while the notes of the enemy countries had considerably depreciated."

YEAR'S PRODUCTION.

Messrs. Montagu and Co. recall that a great feature during the year has been the extremely large export of gold from the United States of America. At the beginning of August about $17,000,000 had been arranged for shipment thence to Europe. Over two millions of this amount was on the way to this country on board the "Kronprinzessin Cecilie," a German liner, which returned to New York in order to avoid risk of capture. Very substantial amounts have been transferred from New York to Ontario since hostilities began, and are there deposited on account of the Bank of England. There is no reason to anticipate otherwise than a further reduction in the world's output, owing chiefly to a substantial decrease in the production of the Transvaal. Assuming the United States Mint figures for 1913 to be correct, there is a possibility of the total production for 1914 falling to about £92,000,000.

GOLD HOLDINGS.

In addition to the gold held against notes by the Bank of England, the following amounts were held by banks in the United Kingdom (including the Bank of England) in the last week-day of June each year, and include every year since 1907, when a return was first made:—1907, £33,296,802; 1908, £50,369,167; 1909, £49,221,074; 1910, £44,214,173; 1911, £54,009,977; 1912, £60,640,681; 1913, £69,524,127. The extraordinary capacity of India to attract gold attained its maximum in 1912, when no less than £27,800,000 was imported. In 1913 the total fell to £18,500,000, and this year to £8,150,000 (approximately). The reduction in the total of 1913 related only to the portion imported in the form of sovereigns, for the shipments of bar gold from England during that year were well maintained, as will be seen from comparing the following totals:—1912, £8,104,000; 1913, £9,917,000. No doubt the same result would have obtained in 1914 had not the war intervened. It may be recalled that the reserves of gold held in India on account of the note issues rose from £8,400,000 at the beginning of 1912 to £17,300,000 at the close of 1912, shewing that £8,900,000 of the sovereigns imported in that year had displaced an equivalent value of silver rupees held in the currency reserves.

BAR GOLD.

The price of bar gold, which had never exceeded its minimum of 77s. 9d. per ounce standard since 2nd October, 1912, rose on 10th February to 77s. $9\frac{1}{8}$d., and was quoted mostly at a premium—varying in extent—until 12th May. On 5th May and on a few subsequent days 77s. $9\frac{7}{8}$d. was fixed—the highest quotation since 16th October, 1909. The premium arose from considerable competition, particularly between France and Germany, but an important factor in regard to the rise was the strong weekly demand for India. A record shipment of £317,000 was made to the last-mentioned country in the third week of April. It must not be assumed that a keen demand for sovereigns necessarily causes a premium on bar gold. In 1913, for instance, there was an exceedingly strong demand for British coined gold, minted at 77s. $10\frac{1}{2}$d. per ounce, yet the price of bar gold never exceeded the minimum, but in 1914, though sovereigns were less in request, the price of bar gold went to a premium. This is worthy of notice, for, considered as bullion, sovereigns are comparatively an expensive remittance. Allowing for the difference between the current and the mint weight of a sovereign, the price per ounce of exported coin must be reckoned as about 78s. The coinage of gold in the Empire during 1913 showed a considerable decrease. This reduction is largely accounted for by a lessened demand for India during 1913. The Royal Mint reported the issue of gold coin as detailed below:—England: 1912, 33,350,249; 1913, 27,638,789. Australia: 1912, 9,113,401; 1913, 9,207,467. Canada: 1912, 515; 1913, 3,742. Total, 1912, 42,464,165; 1913, 36,849,998.

MORE LIGHT ON THE CYANIDE SITUATION.

The History of the Growth, Eclipse and Resuscitation of the Industry in the U.S.A.—The Moral for South Africa.

At a recent meeting of the New York section of the Mining and Metallurgical Society, Mr. Ruhl, of the Roessler & Hasslacher Chemical Co., discussed the beginnings of the American industry as below:—

I really did not expect to speak to-night, and have not prepared an address, therefore can only make a few general remarks on the present cyanide situation; all well known history. Our firm began the manufacture of cyanide in this country in 1890, at Perth Amboy, New Jersey, making the first potassium cyanide of 98 to 99 per cent. guaranteed purity, by the old method from potassium ferro-cyanide, using both domestic and foreign raw materials, the latter permitting us to export cyanide made in the United States to Mexico and other Central American countries. It was seven years before we sold the first carload at 45c. per lb., a most memorable event, although we were told, after the success of the cyanide process in the Transvaal was assured, that cyanide would be wanted here also, by the carload, every hour of the day. The first carload was not sold for gold extraction, but for the fumigation of orange trees, the only recognised remedy against the San Jose pest. Among our first customers were the Mercur gold mines at Mercur, Utah, and the Brodie cyanide plant at Cripple Creek, Colorado, where I first met your secretary, Mr. Ingalls. J. R. Delamar placed the first carload order for the Nevada Gold Mines, which he had just acquired, after his failure with the Rothwell chlorination process. He only then came to the conclusion that cyanide in its concentrated form was by far a better material to transport than chloride of lime, in large, bulky cases, as the contents of these casks of his first supply were strewn all along the 175 miles from the Milford railroad station to his mine at Pioche, Nevada. Delamar started with 6 to 8 lb. of cyanide for each ton of ore, the value of the ore at that time being $60 in silver and $15 in gold per ton. As he was anxious to recover the precious metal, he did not mind how much cyanide was used so long as he could secure big results, but it also did not take him long to discover that he was wasting cyanide. The price at which we sold him the first 100 tons was $32\frac{1}{2}$c. per lb., f.o.b. New York. We tested the feed and tailing of the Nevada Gold Mines and advised the neutralisation of the ore with lime or caustic soda before cyaniding, which would cut down the consumption of cyanide to 4 lb. per ton of ore. Several years later, Delamar's manager, Hartwig A. Cohen, openly boasted of having reduced the consumption of cyanide to 1 lb. per ton of ore, but failed to mention that the refractory ores had fallen in value to $10 per ton. With the enactment of the Dingley tariff act of 1897, reducing the rate of duty from 25 to $12\frac{1}{2}$ per cent. *ad valorem*, we were compelled to cease the manufacture of potassium cyanide. For several years, during the period of the Transvaal war, we resorted to the importation of cyanide. In 1902 we took up the manufacture of sodium cyanide, producing it synthetically, according to an invention of an American chemist, Hamilton Y. Castner. It took fully ten years to reach the high standard of sodium cyanide which we are now producing, equivalent to 128 to 130 per cent. potassium cyanide, now universally recognised as the only proper material for electro-plating, fumigation, and gold extraction purposes. Unfortunately for the United States mining industry and ourselves, after the enactment of the Wilson tariff act of 1913, putting cyanide on the free list, the output of our cyanide factory at Perth Amboy, New Jersey, was not equal to the growing needs of this country; thus it was necessary to import cyanide to meet the increasing requirements of the United States. At the outbreak of the present unexpected European war, we immediately proceeded to rehabilitate our factory at Perth Amboy, by obtaining additional and sufficient supplies of raw materials so as to operate our works on a much larger scale than heretofore, and thus meet the extraordinary conditions. In addition to this, arrangements have now been made to procure a 1,000-ton shipment of cyanide from Germany, which is to come forward on an American ship, and this will also relieve the situation in Mexico, as all the cyanide we intend to import is to provide for Mexican consumption. If, in common with all other countries, the United States were on a free trade basis, no protection would be necessary; but with a protective tariff on some things and cyanide on the free list, we are handicapped in the cost of production by reason of the higher cost of raw material, labour, land, equipment, and capital investment compared with European conditions. The total annual consumption of cyanide in the United States is about 2,000 tons, and in Mexico 5,000 tons. With the enlargement of our Perth Amboy plant, which is now almost ready to begin operations, we shall be able to supply the whole consumption of the United States, but must continue to rely on importations to supply the Mexican demand. Under the Dingley tariff of $12\frac{1}{2}$ per cent. *ad valorem*, an amount of protection with which we were quite satisfied, we were able at all times to supply the whole American demand. The raw materials we consume are sodium, ammonia, and carbon.

GOLD AND COAL PROSPECTS OF WELGEDACHT EXPLORATION.

Dividend of 1s. per Share—Gold Section Dormant—Development of Coal Section.

At the thirteenth ordinary general meeting of the Welgedacht Exploration Co., Ltd., held in London, Mr. P. G. Hamilton Carvill (chairman of the company), presided. The Chairman said: Gentlemen, I presume that, in accordance with the usual custom, the directors' report and accounts may be taken as read. I have, however, a few remarks to make about the balance sheet. The capital of the company remains at the figure of £156,750. The amount of £50,000 general reserve account is the same as in the last accounts. The item sundry creditors consists of trading accounts in the ordinary way of business remaining unpaid at June 30th last, which have since been paid. Rents received in advance account—this represents an amount received from our farm tenant for rent to September 30, 1914, paid by him in advance. On the other side of the balance sheet the figure of £169,556 1s. 9d., at which the property and equipment account stands, includes the freehold of the farm Welgedacht, together with 1,240 gold mining claims, also expenditure on the coal and gold sections to June 30, 1914. The cash account stands at £15,485 14s. As mentioned in the last annual report, this was mainly out on short loans, which have now come under the provisions of the Stock Exchange emergency rules. A satisfactory rate of interest is being received.

DEVELOPMENT WORK.

The work carried out on the property during the past year has been confined to the coal section. You will have observed from the consulting engineer's report that the area developed in the south-west section at June 30th last was 51 acres, and that there is a further 50 acres outlined by boreholes still to be developed. In addition there are further known coal-bearing areas on your property beyond those proved by boring. The figures relating to the working of the coal section are stated in the report, and consequently need not be repeated. The labour troubles which occurred in the Transvaal during the months of August, 1913, and January, 1914, caused considerable variations in the monthly coal output, owing to the dislocation of trade. The outbreak of war and the rebellion in South Africa have caused a certain amount of fluctuation in the demand and selling price, but so far the output has not been seriously affected. The expenditure and revenue account shows a very satisfactory item of revenue derived from the sale of water pumped from the gold section. The influx of this water, as has been previously explained, was the cause of the suspension of work on the gold section; so that, if not exactly a blessing in disguise, it may be truthfully said that the best has been made of what was undoubtedly first considered an unmitigated misfortune. As will be seen from the profit and loss account, the profit earned during the period now reviewed amounted to £6,479 11s. 11d.; this, added to the amount of £5,561 11s. 9d. brought forward from the last accounts, makes a total of £12,041 6s. 8d. to the credit of profit and loss account.

German-owned Belgian Works.

It has perhaps heretofore escaped general attention that some of the important metallurgical works of Belgium were owned and operated by Germans previous to the war. According to the *Engineering and Mining Journal* of New York, the zinc smelteries at Overpelt and Lommel are concerns of Beer, Sondheimer & Co., who are also heavily interested in Engis and Prayon, while the great silver-lead refinery of the Usine de Desargentation Soc., Hoboken-lez-Anvers, is a plant in which the Metallgeschaft and the Deutsche Gold- und Silber Schiedeanstalt are heavily interested. It is a fair assumption that special pains have been taken to keep these works out of harm's way. The refinery at Antwerp was uninjured during the bombardment and remained in operation up to October 6. It then became idle, but German papers of the latter part of October reported that it would be put in operation again as soon as possible. According to recent reports zinc smelting is going on right along at Lommel and Overpelt, and but little damage is said to have been done to the works on the Meuse.

MORE "SAFETY FIRST" LESSONS FOR THE RAND.—III.

Details of the Safety Movement in the Lake Superior Iron Region.

[BY EDWIN HIGGINS, PITTSBURG, PA.]*

The activities of the Bureau of Mines have doubtless been instrumental in furthering the work of safety. Its chief function has been a stimulating activity in safety, rescue, and first-aid work. The moral effect of the presence of the car and its attendants has served to call the attention of the miner to the fact that the subject of safety and first-aid is of sufficient interest and importance to cause the Government to take an active hand in the work. The Bureau of Mines' representatives have worked in co-operation with the operators and everyone else engaged in safety work in the region, and have been favoured with most courteous treatment and co-operation in all their efforts. It might be added here that the writer has, for the past two years, served as district engineer of the Bureau in the Lake Superior region.

RESULTS OF THE SAFETY MOVEMENT.

It is not possible at this time to prepare a statement that will indicate the full measure of benefit derived from the practice of safety work in the Lake Superior region. The safety movement is practically in its infancy, and a period of years must elapse before any fair estimate can be made of the actual good resulting from it. That all classes of accidents are steadily decreasing is shown by tables submitted herewith; the next few years should show a proportionate or even greater decrease. Inquiries as to the reduction of accidents through safety work directed to all the operators of the district were answered, in a majority of cases, by the statement that records are not yet available; there were many indefinite replies stating that accidents had decreased; no replies were received stating that accidents had increased. Personal inquiry by the writer brought forth statements from the most important operators indicating that safety work has caused a material reduction in accidents, and that they are all desirous of continuing the work. In many instances a great deal of enthusiasm was displayed. An interesting statement regarding fatal injuries sustained by employees was received from the management of a large iron mine. It may be remarked that this company began active safety work early in 1912. The statement appears in Table I.

TABLE I.—*Record of Fatal Accidents in an Iron Mine.*

Year.	Total Number of Men employed per Day.	Number of Fatal Accidents per Year.	Fatal Accidents per Year per 1,000 Men employed.
1889	185	2	10.81
1892	224	2	8.93
1893	259	1	3.86
1898	312	11	35.26
1905	372	3	8.07
1906	719	16	22.25
1907	731	5	6.84
1908	874	3	3.43
1909	1,050	8	7.62
1910	1,317	12	9.11
1911	1,235	6	4.86
1912	729	5	6.86
1913	1,548	5	3.23

No accurate records exist of accidents in the Lake Superior mines for a period of years. The Bureau of Mines only began the collection of accident statistics in metal mines in 1911. However, a compilation showing the fatal accidents for ten years previous to 1911 has been made by O. C. Davidson, General Superintendent, Oliver Iron Mining Co., Iron Mountain, Mich. Mr. Davidson reviewed the county mine inspectors' reports from September 30, 1901, to September 30, 1911. With the data thus obtained, and tonnages based on statements of shipments published by the *Iron Trade Review*, he was able to prepare this interesting statement. The compilation is submitted herewith as Table II. Attention is directed to the low death rate indicated in Dickinson county and the high rate in Iron county. The number of fatal accidents and other data for the years 1911 and 1912 are shown in Table III. It may be noted from this table that Minnesota stands first and Michigan second in the column showing the number of men killed per thousand employed. The other States included in this table comprise the chief metal-mining States of the country. The figures for Michigan and Minnesota serve the further purpose of showing the decrease in fatal accidents as compared with the ten years indicated in Table II. These figures were obtained from *Bureau of Mines Technical Paper No.* 61, Metal Mine Accidents in the United States during the Calendar Year 1912, by A. H. Fay. Figures for 1913 are not yet available. From county mine inspectors' reports, however, it is probable that the accident rate for the Lake Superior region during 1913 will show a marked decrease.

TABLE II.—*Summary of Fatal Accidents in Michigan Iron Mines from September 30, 1901, to September 30, 1911.*

County.	Tons of Ore Mined Ten Years.	Total Number of Employees Ten Years.	Number of Fatal Accidents Reported.	Tons of Ore Produced per Fatal Accident.	Fatal Accidents per 1,000 Men Employed.
Dickinson	22,601,474	31,836	84	269,065	2.638
Marquette	36,721,389	57,161	248	148,070	4.339
Gogebic	29,191,952	42,471	226	129,168	5.321
Iron	17,986,380	20,962	158	113,838	7.537
	106,501,195	152,430	716	148,745	4.697

TABLE III.—*Fatal Accidents in Various Metal-Mining States during the Calendar Years* 1911 *and* 1912.

State.	Number of Operators Reporting.		Total Number of Employees.		Number Killed.		Killed per 1,000 Employed.	
	1911.	1912.	1911.	1912.	1911.	1912.	1911.	1912.
Alabama	25	20	4,101	4,827	10	33	2.44	6.84
Arizona	352	179	12,768	15,591	70	67	5.48	4.30
California	855	1,048	10,877	10,312	38	40	3.49	3.88
Colorado	660	624	10,404	8,892	43	48	4.13	5.40
Idaho	513	639	4,801	6,229	23	29	4.79	4.66
Michigan*	74	79	31,584	29,469	134	96	4.24	3.26
Minnesota†	40	43	16,548	16,559	76	50	4.59	3.02
Wisconsin‡	8	11	1,157	2,338	2	9	1.73	3.85
Montana	332	405	13,346	13,340	62	50	4.65	3.75
Nevada	472	554	6,210	7,547	50	34	8.05	4.51
Utah	295	336	7,710	8,458	49	41	6.36	4.85

* In copper mines, 14,893 men employed, 44 killed, 2.95 killed per 1,000 employed. In iron mines, 14,378 men employed, 52 killed, 3.62 killed per 1,000 employed.

† All iron mines. ‡ All iron mines.

In summing up the beneficial results of the safety movement, it may be said that by far the most valuable accomplishment has been the reduction in the number of deaths, and serious and permanent injuries. This, of course, has been brought about through the improved working conditions in the mines, more vigorous inspection, and the reduction of the hazards to the worker through the use of various safety devices. Bodily suffering has been reduced, the earning power and efficiency of the worker has been increased, and mental suffering and hardship on the part of widows, orphans and other dependants has been lessened. Not only have beneficial results been forthcoming from a humanitarian standpoint, but also from a financial standpoint. When a miner is injured the money that he can contribute toward the support of his dependants is curtailed in proportion to the seriousness of his injury. If the miner is killed the support of his dependants devolves upon others, thus giving them a double burden to bear. The employer also sustains financial loss, both in hospital expenses and in the payment of compensation. On the Marquette range, when a miner is killed, it has long been a custom for the entire mine force to cease work until the victim of the accident has been buried. The loss caused in this way amounts to approximately $2.30 per day per man involved, and an average of $500 in fixed charges to the company for every fatal accident. Another source of financial loss is that sustained by the taxpayers for the maintenance of courts for the trial of damage suits. Investigation discloses that in one Minnesota county $75,000 per annum has been spent in this manner. In addition to the reduction in the loss of life, and the saving in money to both the miner and the operator, other benefits have developed. There appears to be a better understanding between employer and employee, and the miners are beginning to realise that the safety work is being done for their benefit. Throughout the district a strong spirit of co-operation is noticeable, not only between the miner and employer, but between the officials of the various mining companies and mining districts. Information regarding safety and efficiency work is exchanged between operators with the utmost freedom, and there is hardly a mine in the region that is not open for inspection as far as safety devices and methods are concerned.

(To be continued.)

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* Paper read before A.I.M.E.

HIGH MINING SALARIES

For those holding Certificates as Mine Managers, Mine Surveyors, Mine Captains, Mechanical and Electrical Engineers and Engine-Drivers. Private Individual Tuition and Correspondence lessons where personal tuition is impossible. Practical Mathematics and Electrotechnics.—E. J. MOYNIHAN, Consulting Engineer, 35-6, Cuthberts' Buildings, Box 2061, Johannesburg.

THE PERSISTENCE OF ORE IN DEPTH DISCUSSION.

Some Critical Views—Opinions of Messrs. J. S. Olver, S. Vivian and Dr. Maclaren.

THE following are further contributions to the discussion on Mr. Rickard's paper before the Institute of Mining and Metallurgy:—

Mr. John S. Olver said his experience was almost entirely confined to the Rand, of which he thought he had rather an unusual knowledge. They had heard a very emphatic opinion expressed, and he was not going to oppose that opinion; he would simply say that he himself had not formed an opinion. He very much doubted if the Rand could be regarded in the same way as other ore deposits. He rather took exception to the author drawing illustrations from the Rand at all. Personally he was inclined to think that it should be excluded, and that one could scarcely deal with it on the same lines as one could deal with fissure veins. What the source of the lode was he should not like to say. Personally he had seen no explanation that met all the facts as he had seen them, and he was inclined to doubt whether there was any real relationship there between value and depth. He was not giving a final opinion in any way, but so far he had not seen any definite proof of it.

Mr. S. Vivian said that two of the speakers had referred to a point that occurred to him, viz., that the Witwatersrand reefs were not typical for the purpose of that discussion. To explain his reason for thinking so, he would like to put forward a theory of his which he had held for some time with reference to the gold values in those beds. He thought that, having regard to the comparative regularity in thickness of the reefs over such extensive areas, it was a fair conclusion to come to that they were deposited in a horizontal position. He thought, as the gold values ran so generally throughout them, that it was also reasonable to conclude that the gold entered into the reefs while they were still horizontal. If those deductions were correct, he did not see how their present depth could have anything to do with variation in value any more than the position of any area along the present strike had, because had the up-tilting pressure come from a different direction, what was now the strike might have been the dip of the beds, and vice versa.

Mr. J. Malcolm Maclaren: I beg to enter a vigorous protest against Mr. Rickard's interpretation of my views on the persistence of ore in depth. I have never suggested that "Mr. Rickard's effort to smash a fallacious generalisation is likely to prove 'exceedingly harmful both to the mining engineering profession and to mining capital,'" nor have I ever demurred from his general conclusion, which, as I understand it, is a denial of the truth of the theory of the persistence of ore to indefinite depths. I have, however, endeavoured to show that the "universal acceptance of Mr. Rickard's proposition would prove harmful," and, stating the same idea elsewhere in other words, have said that I considered his negation of the possible persistence of ore in depth "pernicious doctrine, if universally applied." Brieflv, we are in complete accord concerning the rule, but while Mr. Rickard appears to maintain that there can be no exception, I insist that there may be exceptions of economic importance. Indeed, it has been on account of our general accord that I have elsewhere discussed the minor point of divergence rather than the general ground of agreement. Nevertheless, I am bound to confess that while in theory I accept the rule, in practice I am always hopeful of finding the exception. On Mr. Rickard's own showing such exceptions do exist, and are of economic importance, inasmuch as the deep levels of these mines yield a profit. In discussing this subject elsewhere I have pointed out that the rare exceptions to the general rule are found in pre-Cambrian rocks or in the unique Mother Lode belt of California. The three principal cases cited by Mr. Rickard, viz., Kolar, St. John del Rey, and North Star, bear out my contention. The argument from the Tasmania does not appear to be helpful. The Tasmania has failed at shallow levels and not in depth, as we understand the term in the present discussion. Fifteen hundred feet is not deep as modern mines go, and numerous mines in the notoriously shallow Tertiary andesitic regions have carried ore to greater depths. Moreover, the water that has been the bane of the Tasmania has rendered, and doubtless will always render, it impossible to say whether the decrease in the value of the ore is permanent or whether it merely marks a poor horizontal zone between two productive shoots. One of Mr. Rickard's conclusions demands critical examination, viz., that one that postulates that "most orebodies . . . . . are geologically young." So much may be admitted at once for all that ore dependent on Tertiary igneous activity, but I venture to assure Mr. Rickard of my belief in the pre-Cambrian age of most ore-bodies in the pre-Cambrian regions of India, Australia, South Africa, and North and South America (the two last only in the east of the continents and therefore away from the influence of the Cordillerean and Andean eruptives). Proofs are too lengthy to detail here, but the following are facts typical of one region, viz., Western Australia. There the latest members of the pre-Cambrian complex are fresh, unaltered diabase dykes. At Ravensthorpe (Phillips River) they cut through and absorb the copper lodes for lengths of 80 ft. At Meekatharra and Nannine they similarly absorb and intersect auriferous lodes. The best example is probably that of Robinson mine, Nannine. Here the magma has not been sufficiently hot and fluid to absorb the rich gold quartz of the lode, and a drive across the diabase dyke in the track of the lode showed numerous blocks and fragments of undigested quartz, of a value fully equal to that worked elsewhere in the lode. We have here, therefore, an example of a pre-Cambrian ore-body that owes nothing to later enrichment. I am informed by Mr. Montgomery, Chief Engineer of Mines, Western Australia, of similar cases of the intersection of gold lodes by pre-Cambrian acid igneous dykes. In similar fashion the geological age of many ore-bodies is definitely known and is not a matter of pure assumption, as Mr. Rickard apparently infers, nor is the geological evidence of their age affected by the discovery that another and far-removed deposit, as the Homestake, may be much younger than had previously been believed. Mr. Rickard also believes that orebodies may be the result of chemical reactions long post-dating the waters that precipitated the primary ore. It may be so; I certainly cannot produce any positive evidence of value to the contrary, but in my experience it has lately seemed to me that primary ore is normally deposited during a single continuous geological period. Were it otherwise, it is then difficult to advance any satisfactory explanation of a common condition underground in which we have two or more fissures of the same age, in the same rock, and with the same gangue, one of which is metalliferous and the others barren, except on the assumption that only one fissure was open to metalliferous solutions at the geological moment of ore-deposition, and further, had ore-impregnation been continuous over long periods, or had it been oft repeated, then it is exceedingly improbable that other fissures would not have been accessible to impregnation. I gladly seize this opportunity of expressing my indebtedness to Mr. Rickard for a thoughtful and stimulating exposition of his views on a subject of importance now and of still greater importance in years to come as mines grow deeper and untried outcrops become rarer.

Vogelstruis Estates and Gold.

RENEWAL OF PLANT AND MACHINERY ORE RESERVES INCREASED.

The nineteenth ordinary general meeting of shareholders in the Vogelstruis Estate and Gold Mines, Ltd., was held in London in mail week, Mr. John Stein Morrison presiding. The Chairman said: "To get a fair grasp of the position it is impossible to avoid being somewhat retrospective; but it will only be necessary to take you back to our balance sheet of June 30, 1911 three years ago. On that date we had liabilities amounting to £6,877, and we were face to face, also, with large commitments in respect of renewals of plant and machinery; and, in addition, for the purpose of opening up the eastern portion of our property, we had to contemplate expenditure on a shaft. Since June 30, 1911, we have paid all back liabilities, including debenture interest, £18,026, and, as you will see by the balance sheet, we had on June 30 of this year £13,300 2s. 5d. cash at our bankers. We have now no liabilities beyond those of a month to month order. The altered position is a source of comfort. Our plant and machinery having been in service for nearly twenty years, you will not be surprised to hear that it had to be renewed almost completely, and on that section alone we have spent to June 30 last £26,357, entirely out of current revenue. Although the equipment of the new shaft is complete, and we have sunk to a depth of 483 feet, the expenditure on this is not at an end, as we have to sink to a much greater depth still; but the additional expenditure, when incurred, will also come out of current revenue. Up to June 30 last we have spent on this shaft £13,034—all paid out of current revenue. The renewal of our 80 stamp battery will be completed, we hope, by April next, and when we have added a tube mill we can then fairly say that our plant and equipment is practically new throughout and up to date, and capable of treating an increased tonnage. When these payments have been met we will be at the end of our extraordinary expenditure, and can then turn ourselves resolutely to the extinction of the profit and loss debit, and, judging by what we have done during recent years, unless there is a falling off in the ore grade, we may reasonably hope to accomplish that most desirable object in due time. Another satisfactory feature is that our ore reserves on June 30 last amounted to 245,000 tons—which is 37,443 tons in excess of the reserves of June 30 last and as the dead work of these reserves stands at a very conservative figure about 2s. 3d. per ton we have every reason to be satisfied on that point.

Natal Coal Returns.

The average number of white men in the employ of coal mines in Natal in November was 472, compared with 556 in October. The Asiatics numbered 3,595, as against 3,688 in the preceding month, and the natives 7,280, as against 6,829. The total number of persons employed was 11,347, as against 11 073 in October. The tons mined were 167,898, compared with 191,825 in October. Bunker coal at Durban totalled 83,996 tons; 3,381 tons were exported Overseas and 25,910 to Union ports

Rhodesian Section.

LATEST MINING NEWS.

Rhodesian Gold Output for December and for 1914—Masterpiece—Bulawayo Syndicate—Rhodesia Trading—Weil Group of Mines—Giant Mines of Rhodesia—Enterprise Gold—London and Rhodesian—Mr. J. Weil on the Progress of Rhodesia—Cam and Motor—

THE December gold output of Rhodesia shows a decrease of 850 ozs. on November. The following are the returns:—Matabeleland, 36,646 ozs., value, £153,914; Mashonaland, 37,343 ozs., value £255,755; total, 73,889 ozs., value £309,679. The total for 1914 is therefore £3,580,218, as against £2,903,260 for 1913.

* * * *

The trial crushing at the Masterpiece has been very satisfactory, and if it is an indication of what is in store Mr. McAdam's mine is likely to resume the prominent position it held some few years ago prior to the unfortunate litigation with the London company that has kept it dormant in the interim.

* * * *

Although the Bulawayo Syndicate, Ltd., after providing for depreciation on investments, made a profit of only £145 for the year ended October 30 last and is consequently unable to repeat the small dividend paid a twelvemonth ago, the company's financial position remains a strong one. The chairman pointed out at the recent meeting that after deducting the item of sundry creditors, the high-class investments, cash and amounts due on land sales represented a total of over £59,000, or more than 60 per cent. of the capital of the company. He added that this position was not only a strong one, but that it was better than at the corresponding date last year. The company's most important assets, outside those of a more or less liquid character referred to above, are its land holdings of over 277,000 acres and its holding of 8,000 shares in the Fife-Scott Ranching Syndicate. With the return of normal times considerable increase in revenue is expected from both these assets.

* * * *

In submitting accounts for 1913-14, the directors of the Rhodesia Trading Co. state that the progress made in extinguishing the old losses has been arrested. The company's customers have been crippled by drought, while the tobacco crops in which their capital is locked up failed to find purchasers at adequate prices. During the last two months the drought appears to have broken, good rains being now reported in numerous districts. All business, especially in Salisbury, was further injured by the uncertainty caused by the attitude of the Imperial Government as regards the political future of Rhodesia. The loss has been added to by thefts from the company's stores at Beira, amounting to about £3,000. A change of management in Rhodesia has also resulted in consequential loss to the company. The sales for the year ended September 30, 1912, were £230,646; for the year ended September 30, 1913, £249,870; and for the six months ended March 31, 1914, £112,023. The loss for the year was £8,418, reducing the balance brought forward to £16,011.

* * * *

The Weil group of Rhodesian companies has issued four of their annual reports—those of the Cam and Motor, Enterprise, Giant, and London and Rhodesian Mining and Land Companies—and the meetings have been held in London. These reports show that the policy of propping up one company at the expense of the rest of the group is being continued. The Cam and Motor's balance sheet shows that company to have borrowed up to June 30 last £111,600, mainly from the London and Rhodesian. In turn the latter has itself borrowed £172,000, a good part of which is probably against securities deposited with the Giant and Enterprise companies, which have respectively lent sums of £97,000 and £26,000 to unnamed borrowers. In the meantime shareholders have to go without anything. Again, the London and Rhodesian has agreed to subscribe for £50,000 Cam and Motor debentures, redeemable in five years, and furthermore in partnership with the Giant Company has agreed to put up another £50,000 to purchase one-half share in the Cam-Good Shepherd properties. The London and Rhodesian has been given a call at par, less a commission of 10 per cent., on 100,000 Cam and Motors for a period of two years after peace is declared. This is not encouraging for those who have paid premiums ranging up to £1 per share for Cam and Motors during the past two or three years. Much was hoped from the Cam and Motor's plant working successfully from the start, whereas it has had to be remodelled at great expense in time and money. Recent results have been more encouraging.

* * * *

The ordinary general meeting of the shareholders of the Giant Mines of Rhodesia, Ltd., was held in mail week. Mr. Samuel Weil (Chairman of the company) presided. *Inter alia*, the Chairman said:—

Referring to the profit and loss account, the result of operations for the year shows a profit of £34,189, mainly due to our manager, Mr. R. Allwright, having been able to reduce working expenses from 13s. 3d. to 10s. 7d. Our working profit amounts to only 5s. 6d. per ton, this being due to the low value of the ore milled. After making the usual allocation for depreciation, etc., a net profit of £18,055 is shown, which, added to the amount brought forward from last year, leaves available the sum of £26,540. Of this we have written off £5,320, being cost of boring operations during the period, and have transferred £20,000 to reserve account, bringing this item up to £100,000, which the Board consider a sound policy in view of the position at the mine. Turning to the assets side, you will notice a slight alteration in the property and outlay account. This is due to expenditure on the Cam-Good Shepherd option. The other items do not, I think, call for any comment on my part, being all clearly set out. It is fortunate that, notwithstanding the difficulties arising out of the subsidence referred to in the report, we have been able to keep the mill running during the year, with, however, a reduced tonnage. As to how long we shall be able to continue operations, our manager will not commit himself, but, from latest advices received, he anticipates being able to keep the mill running for some months to come. The reduction in working costs, to which I have referred, has, I am pleased to say, enabled him to treat a large amount of ore which hitherto had been considered unprofitable. The only development work of importance now being carried on the Giant mine proper is a continuation of the long crosscut referred to in the engineer's report, which will be extended until the granite hanging wall is encountered with a view to ascertaining whether there is any enrichment at the point of contact. In regard to the Giant South, as a result of the boring operations referred to in last year's report, it was decided, on the advice of our engineers, to dewater the mine and equip the shaft preparatory to starting up work. This has been completed and development work has now started, but some little time must elapse before any definite opinion can be expressed as to building up a tonnage of payable ore.

* * * *

Like its stable companion, London and Rhodesian Mining, the Enterprise suffered during the twelve months ended with June from loss of income on its holding of Giants, its total receipts being no more than £3,963. This, however, covered expenses and left a balance of £331. Expenditure on exploration and prospecting has not been included in the profit and loss account, and, though a further 90 claims have been abandoned, the book value of "property and outlay" has increased to £3,829. On the other hand, investments standing at £133,318 had a market value on June 30 of £160,132, besides unquoted shares taken in at £16,746. Cash and debtors amount to £39,141, against creditors for

£11,566. Exploratory work disclosed nothing justifying immediate attention, though certain low-grade deposits may be tested again in the future.

* * * *

Owing to the cessation of dividends by the Giant Mines, the London and Rhodesian Company's revenue declined last year from £49,657 to £24,097 and the net profit from £43,515 to £18,187. The share investments stand in the balance sheet at £310,944, but their market or estimated value is £353,193. Nevertheless, of the £28,094 to the credit of profit and loss account, the directors have allocated £28,000 for writing down certain share holdings. The chief business of the twelve months appears to have been financing the Cam and Motor, debtors having risen from £94,033 to £179,573. In order to do this, the London and Rhodesian has itself had to borrow over £100,000, its creditors now amounting to £171,842, and cash in hand has been reduced to £11,634. Probably, since the close of the year these figures have undergone change, as the Cam and Motor Company has re-arranged its finances. At the annual meeting Mr. J. Weil said, *inter alia*:—" There is interest acquired during the year which one may now describe as being one of our own properties—I am referring to the properties lately belonging to the East Gwanda Mines. These properties were worked some few years ago under the auspices of a company of that name, and a very large tonnage was put through the West Nicholson mill, producing upwards of £589,843 in gold. Owing, however, to high working costs, and to the fact that most of the ore was carried by rail from the respective mines to the mill on the West Nicholson property, the company was unable at any time to work at a profit. The African and European Co., in conjunction with the London and Rhodesian Co., advanced certain sums to the old company on mortgage, and eventually foreclosed. While we think that most of the properties are unworkable at present, yet in the Jessie mine, one of the properties taken over, there is a very fair tonnage already opened up of payable ore. It is our intention, so soon as conditions permit, to transfer a section of the 60-stamp mill on the West Nicholson mine to the Jessie property, and to start up operations on this property tributing the other mines as opportunity permits."

* * * *

" The outlook for Rhodesia during the early months of the year showed considerable activity and progress," said Mr. J. Weil at the London and Rhodesian annual meeting, " and the output from the mines aggregated for the year ended June 30, 1914, was tabulated at £3,180,848, an increase of £383,824, and in view of the several additional mines which will be reaching the producing stage shortly, I think the estimated figure given in the general manager's report of £4,000,000 is a safe one for the year ended June 30, 1915. Notwithstanding the difficulties created through the war by general dislocation of mining requisites and shipping the various producing companies under the control of our group have been able to mill continuously, owing to their foresight in laying down sufficient stocks of mining supplies. This has entailed the locking up of additional capital, but I am sure you will agree with me that it was a wise course to pursue, and I am pleased to say that certain articles needed in connection with mining operations which were formerly supplied by Germany only are now being manufactured in the United Kingdom, whence we shall draw our future suppplies. We are confining our activities to " producing propositions," upon which we can rely for revenue. We are not undertaking any active policy of development and exploratory work on the remainder of your other properties, as we think it best to conserve our resources as much as possible during the parlous times we are passing through. Last year the chairman, in his address to you, referred to the trying period of the Balkan war which we went through as a serious detriment to markets in all classes of securities, including mining shares. In the light of the present stupendous and calamitous war, and its far reaching consequences on commerce and finance, one might be almost tempted to refer to the Balkan crisis in the terms of " those good old times." It is, however, some consolation to feel and know that when peace is restored your company's future, by reason of the nature of its holdings in Rhodesian enterprises, will reap its share in the general revival which is bound to follow in commercial and financial conditions.

* * * *

As milling only started at the end of January, and as the accounts are made up to June 30, it was not to be expected that a big profit would be shown by the Cam and Motor. Although a profit was made during the first few months amounting to £7,825, apparently it was only subsequent to the date of the accounts that real progress was shown. In July extraction was only 63·6 per cent.; last month it had improved to 73 per cent. Working costs, which appeared in the accounts at 26s. 3d. per ton, have since June 30 averaged 24s. 3d., while development in the bottom level, which was not quite satisfactory, has become distinctly encouraging. The balance sheet shows creditors amounting to £111,626 and bills payable to £30,000. Since the date of the accounts arrangements have been made in regard to £50,000 of debentures bearing 7 per cent. interest and redeemable within five years. This sum, together with an amount of £50,000 for a half-share in the Cam and Good Shepherd properties, has been applied in writing down the sundry creditors, leaving apparently only the bills payable outstanding. In consideration for finding subscriptions for the debentures, the directors have given a call of 100,000 shares at par for two years after peace, and the capital, which is now fully issued, is to be increased in connection therewith. The ore reserves are slightly below those twelve months earlier, due to the fact that development work was limited on the No. 6 level. The value is about 3d. per ton lower at 44s. 6d. Considerable difficulty has been experienced with the treatment of its ore, and there is still a good deal of room for improvement, although the extraction percentage has been raised during the last few months. The lates return, that for November, gives the ratio as 73 per cent., which compares with the original anticipation of 85 per cent. Since the plant, a dry crushing one, was brought into operation, nearly twelve months ago, the management has conducted a series of experiments both in the laboratory and in practical working. The results obtained have been satisfactory, but before the maximum extraction can be obtained certain additions and alterations are necessary. The additional plant is now being installed, and the manager (Mr. John McDermott) hopes to have it completed at the end of February. The process of treatment with the modified plant will be:—The roasted ore will be first pulped with water in order to wash out the deleterious compounds before mixing with cyanide solution. The coarse sands in the pulp will be separated for tube milling by Deister classifiers. The ground product will then be classified into sand and slime by Dorr classifiers, and, as the gold contents in the sands are quickly dissolved it is proposed to treat this product in small tanks as quick sand with cyanide solution, the dissolved gold to be subsequently washed out mechanically by Dorr classifiers and Sand table. Finally the sand will undergo a short leaching treatment in vats. The slimes treatment will consists of continuous decantation in Dorr thickeners.

Delagoa Bay Coal Bunkering and Export Trade.

The following are the returns for coal bunkered and exported at the port of Lourenco Marques from the beginning of last year until December 31:—

	Exported.	Bunkered.	Total.
January	20,737	18,192	38,929
February	40,417	15,657	56,074
March	46,557	17,856	64,413
April	27,573	21,771	49,344
May	27,199	20,934	48,133
June	38,406	18,558	56,964
July	28,727	17,509	46,236
August	34,548	15,643	50,191
September	22,024	9,617	31,641
October	40,757	13,243	53,999
November ...	21,538	9,788	31,326
December ...	18,811½	13,827	32,638½
Total (tons	166,401½	79,627	246,031½

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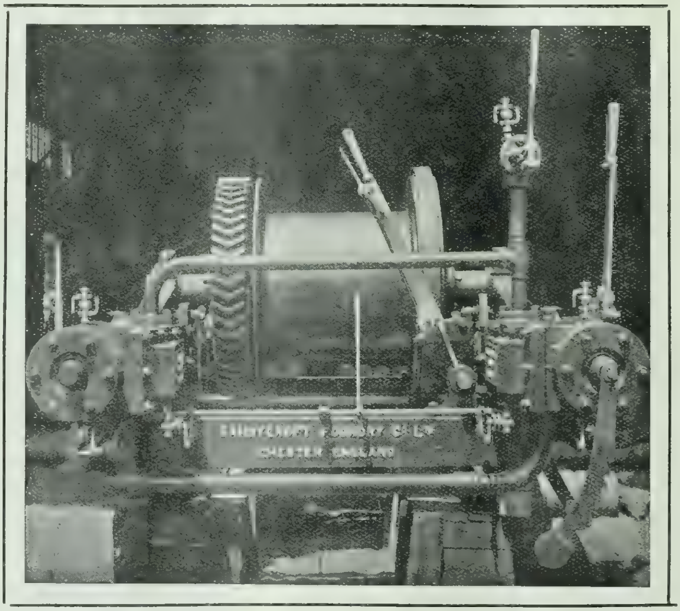

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Engineering Notes and News.

Origin of Sand-Filling.

Sand filling or hydraulic stowing of mine workings is attracting attention in many mining districts. We printed recently a lengthy abstract from a most interesting discussion of the subject by Mr. B. C. Gullachsen, presented to the October meeting of the North of England Institute of Mining and Mechanical Engineers and to be published in full in the *Transactions* of the Institution of Mining Engineers For giving credit for the development of hydraulic stowing to the operators in Silesia and in passing over as of minor importance earlier work elsewhere, Mr. Gullachsen is taken to task in the U.S.A. The whole subject has been discussed in *Bulletin* 60 of the United States Bureau of Mines. From that it appears that the distinction of developing the system belongs to the engineers of the anthracite region in Pennsylvania As early as 1884 hydraulic filling was used, by John Veith at the Buck Ridge colliery near Shamokin, and the subsequent year Mr. Pardee used it at Hazleton. Shortly after it was employed at the Koh-i-noor colliery of the Reading Company near Shenandoah, and by 1886 it was in common use throughout the Lehigh region. In 1890 filling was introduced as a regular practice at the Black Diamond colliery at Plymouth. About that time the district was visited by several German engineers, who spent some time in studying the practice and gave full credit to the Americans for its novelty. Since then it has been more rapidly adopted abroad than in the United States because the higher price received for coal and cheaper labour permitted refinements that have been regretfully postponed by many a thoroughly well-informed American engineer. On the Rand and in Cripple Creek in Colorado, sand from the mills is used. In Europe material is commonly taken from neighbouring hillsides, or from valley lands as at Japanese mines in Manchuria. In the anthracite region the main source of supply has been the culm banks, and this has materially reduced the cost of the work. This claim that the process originated abroad is not new and has been repeatedly disproved. The *Colliery Engineer* published the facts January, 1912 (page 321), February, 1912 (page 385), and especially in May, 1914 (page 537). We regret that Mr. Gullachsen was evidently not familiar with the true history of the matter, though the real merit of his article lies in the other part of his paper, and it will be widely welcomed.

A Dust Arrester for Drilling and Boring Machines.

Much attention is being paid at present to the avoidance of free or floating dust during drilling or boring in stone, coal, or other materials. One method of attacking this problem is by directing a spray of water on to the part where drilling is in progress, but this is not always possible, unless a supply of water is easily available. An alternative arrangement, which has been introduced by Holman Brothers, of Camborne, England, under the patents of M. T. Taylor, consists of providing the drilling or boring machine with a means of arresting and collecting the dust so that it cannot permeate the air. The boring tool is provided with a cup or receptacle slipped over the shank and having a soft-edged mouth, which accommodates itself to the rock surface when pressed against it. The soft edging at the mouth of the receptacle is secured by a sponge collar or gasket. At the lower part of the receiver a nozzle is arranged, from which the dust is led away through a hose into bags or a water trough. A gland closed at the lower end by a rubber washer fits around the drill The machine, when it commences to bore, compresses a spiral spring, which butts against the cup receiver and forces it against the rock surface, and the dust, on coming out of the hole, being unable to make its escape because of the soft edging, passes away through the dust-collecting duct into the receptacle provided. The whole arrangement is extremely simple, and easily applied; its simplicity of application is a strong point in its favour, inasmuch as the average miner is prone to give but little attention to his physical condition if such attention involves any extra trouble in the operation of his equipment. It is to be hoped that with the introduction of dust-allaying devices, miners' phthisis, of which so much has been heard in recent years, will be done away with, or, at least, effectively curbed.

—*Coal Age.*

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SHEET—SECTIONS

TUBE—ALLOYS

Electrical Notes and News.

Cape Electric Tramways.

The directors report that the profit and loss account for the year ending 30th June, 1914, shows a profit of £78,867, and after providing for debenture interest, redemption of debentures, and adding the balance brought forward, a net credit balance of £32,618 remains. The reserve fund has been credited with £8,000, leaving £24,618. The tramways in Capetown carried 16,576,992 passengers, earning £155,472, as against 14,779,709 passengers, earning £144,222 in 1913. In Port Elizabeth 4,309,154 passengers were carried, earning £44,937, as against 4,155,711 passengers, earning £43,036 in 1913. The labour troubles on the Rand, which resulted in a general strike in July, 1913, were followed by a recrudescence of the same trouble in January, 1914, and had a disadvantageous effect on the general business situation throughout South Africa, checking to a certain extent the otherwise satisfactory advance in revenue of the tramway systems in Capetown and Port Elizabeth. In spite of these economic checks the receipts from the tramways show satisfactory advances during the year under review, but, owing to the increase in the cost of maintenance and operating charges, and to the provision for the income tax lately imposed by the Union Government, the net profit is less than that of the preceding year. The additions to the rolling stock and to the power plant at Port Elizabeth have now been completed, and the new unit of power in Port Elizabeth is working most satisfactorily, and giving results of considerable economy in the consumption of fuel. The prevalence of war throughout the greater part of the world, and more especially the rebellion now going on within South Africa, has created such a serious financial and trading outlook, both in that country and elsewhere, that the directors have decided to recommend the declaration of a dividend of only 2½ per cent. They have considered this a prudent course to adopt in view of the present condition of affairs generally. The directors refer to the valuable services rendered by the local boards in Capetown and Port Elizabeth, also by the general managers in Capetown and Port Elizabeth, and the staffs under them. Mr. J. A. Barkley, general manager of the Capetown companies, reports that the total revenue was £155,472, and the expenditure £86,284, leaving a profit of £69,189. The figures for the previous year were: Total revenue £144,222, operating expenditure £77,859, gross profit £66,363. Mr. W. H. Freemantle, general manager of the Port Elizabeth Electric Tramway Co., Ltd., reports that the new boilers and generating plant ordered at the commencement of the year are now in service, and are of ample power to do all that is required without assistance from the Municipality, which has therefore been discontinued. The new boilers and generator have been in service since June 22nd, and from the records available promise to considerably reduce the coal consumption, and will prove a most valuable addition to the company's power station plant. The total revenue amounted to £44,937. The traffic receipts show an increase of £2,134. The operating expenditure totals £27,716, or 61.678 per cent. of the revenue, and is an increase of £2,405 over last year. The passengers carried were 4,309,154 for 1914, against 4,155,711 for 1913, an increase of 153,443.

Whilst urging his countrymen to maintain their activities in the South African market, the U. S. Consul at Port Elizabeth admits that English and German manufacturers made the greatest progress in selling electrical material last year. Electrical machinery from America showed a decided increase over 1912 in the face of a decrease in the total amount of imports. In a short time, he adds, all municipalities of any consequence will be lighted by electricity, and the use of power for manufacturing, heating and lighting is rapidly becoming popular. American goods are slowly but surely increasing in public favour, and it is only necessary for exporters to study a little more carefully the needs and customs of the country to make that increase more rapid. In attempting to do business in South Africa, a new man should make a careful study of business conditions and local customs. Any little courtesy that is extended to a possible purchaser is fully appreciated. Many representatives of British firms make a point of asking the head of the department or purchasing agent to luncheon or dinner at least once on every trip. No promises that the firm will not sanction should be made, and plenty of time should be taken to work each town with care. Once a customer is secured, it is comparatively easy to keep him if his requirements receive prompt attention. In packing goods for Port Elizabeth it must be remembered that, during unloading, articles, unless extremely bulky, are placed in large rope slings or hammocks in the vessel's hold, hoisted out over the side and transshipped into lighters alongside. Consequently a parcel is frequently upside down or on its side. Strap fastenings and blockings should have direct bearings on the contents of the case at every angle.

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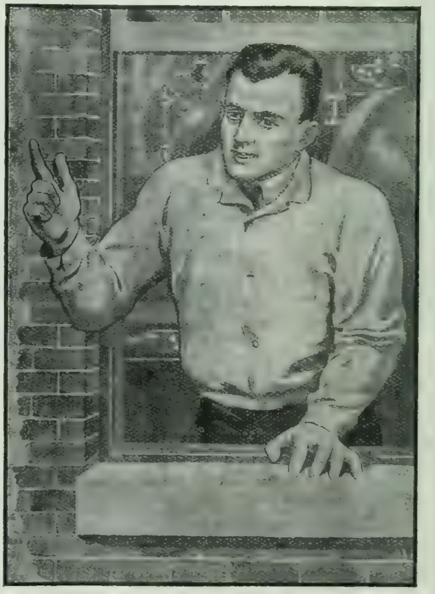

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THE PREVENTION OF ELECTRICAL ACCIDENTS IN MINES.*

A Valuable Practical Contribution on a Question of Growing Importance.

[By T. J. NELSON, A.M.I.E.E.]

UNTIL a few years ago there was no opportunity for practical mining electricians to discuss together the problems encountered in the mines. Every man fought alone, and the sharing of knowledge and analysis of cause and effect, which has been evident in other directions, was notably absent. In the Association of Mining Electrical Engineers these men have at last the medium whereby matters of difficulty and interest can be brought forward and freely discussed. Its members are of many grades and different spheres of action, and from the harmonious correlation of these grades many benefits have been attained. There is hardly a member without some streak of specialised knowledge, and the "pooling" of this is to the mutual advantage of all. The Association is codifying and classifying a miscellaneous heap of useful knowledge, and preserving it in the "Proceedings" for future reference. We are told that "knowledge is power," but power often runs to waste, and certainly the knowledge of how to prevent electrical accidents in mines has been allowed to run much to waste. Mining accidents have evoked much public attention, and there have been many committees of inquiry, but we still struggle with a maze of legislation, and the accidents still continue. The writer desires to express the opinion that the personnel is a factor of greatest importance in reducing accidents. Another is the necessity for combined effort to keep in touch with new developments in safety appliances; and still another is to educate and help the workers and subordinate officials in the dangers attending the use of electricity. The dangers attending the use of electricity in mines are: (1) Accidents from electric shock; (2) accidents from electric ignition of firedamp; (3) accidents from electrically-caused fires. In order to prevent these accidents, the electrical engineer must give careful and constant attention to the following: (a) Provide reliable connection to earth for all outer metallic covers of apparatus; (b) cover all necessary live parts with good quality insulating material, and provide good protection against mechanical damage; (c) use apparatus that has been designed to prevent open sparking; (d) avoid the use of inflammable material near electrical apparatus. The Home Office rules regulating the use of electricity in mines are in every way admirable and necessary. They are framed with the object of securing personal safety to the workers in mines, and of course the stipulations control to a large extent the work of the electrical manufacturer and contractor; but there are many important properties of electrical colliery plant not influenced thereby, or at all events, only indirectly. Electrical manufacturers are not in agreement as to the ratings of totally-enclosed motors. The rise of temperature allowable in such machines is indefinite. The ordinary enclosed motor was originally designed for open running and has simply had the end brackets filled in for enclosed working. The duty of a totally-enclosed motor in a mine is either one of constant full load as for pumping, or widely fluctuating load as in coal-cutting, or again, heavy loads for considerable periods of time as in hauling. The ruling temperatures in the mine workings are higher than normal.

CABLES.

Cables may be divided into three classes: (1) Paper lead-covered; (2) paper bitumen-sheathed; (3) vulcanised bitumen cables, all being armoured. Paper lead-covered cable has some advantages. For instance, paper is mechanically stronger than bitumen, and paper cable can be worked at a higher current density than bitumen without fear of decentralisation. Paper also has greater dielectric strength than bitumen insulation of equal thickness. On the other hand, paper cables are hygroscopic. In the event of the lead sheath being punctured, the entrance of moisture is fatal, as it is almost impossible to eradicate the moisture before it has ruined a considerable length of the cable. Paper cables also present great difficulty where the use of a naked light is prohibited, as it is practically impossible to make a good joint without the use of a blow-lamp or fire for bonding the lead. Paper bitumen-sheathed cables possess the same advantage as the lead-covered paper cables, but do not call for the skilled jointing necessary in the case of lead covering. If the armour is carefully bonded it will give as good an earth return as the lead covering. Vulcanised bitumen cables, in the writer's opinion, are the most suitable for mining work up to 3,000 volts. Hygroscopic insulating materials are no longer essential as a component part of the dielectric of such cables. In the modern vulcanised bitumen multicore cable of the "solid" non-hygroscopic construction, electrical and mechanical factors of safety may be regarded as practically synonymous terms, because mechanical damage must extend almost to the conductors before electrical failure can occur. With this kind of cable carefully installed, there is no danger of breakdown due to moisture and the action of pit waters. Its inertness to ordinary atmospheric influences appears almost infinite, and its durability is not surpassed by any other type of dielectric.

SHAFT CABLES.

One method of suspending a shaft cable is by means of a single suspension fitting, similar to the capping of a winding rope. If this method is used the armour must be designed with a breaking stress of about ten times the weight of the cable. The holding bolts and chains should be similarly proportioned. Another method is by means of cleats fixed at intervals along the cable. This method is the one most generally adopted, the cable being fixed behind the buntons, which serve to support the cleats and at the same time help to throw off any falling material. The cleats should be fixed from 25 to 40 yards apart, according to the weight of the cable. Shaft cables should be in one length whenever possible, because joints are most difficult to make and maintain in mine shafts. But when the shaft is too deep or the cable too heavy to be installed in one length, the joints should be made in a properly constructed recess in the side of the shaft. This recess should be made large enough to allow a man to work inside it, and for the cables to take an easy sweep in and out.

UNDERGROUND CABLES.

These should be placed in the intake, and the position chosen be such as to afford the best protection from mechanical damage. Where there are good side walls and good roofs or arching the cables may be fixed in a permanent manner by means of wood cleats. If there is a liability of damage from falls, the cables should be suspended by tarred rope, brattice cloth, or raw-hide suspenders in such a manner as to allow them to readily break away when struck. Cables should be carefully hung up high enough to be clear of all traffic. For underground cables disconnecting joint boxes should be fixed at intervals, so as to save time in localising a fault. The joint boxes should be fixed in a recess by the side of the road. The writer does not agree with three-way joint boxes in the main cable, but recommends properly constructed distribution houses. After the cables have been carefully installed, they should be inspected daily, and the person appointed should be very observant. He should see that: (a) The cables are properly hanging with a sufficient number of slings; (b) the repairers have not put the cable between new props and the side, or moved the cable too near the signal wires; (c) the cables are not lying on broken timbers, girders, sharp stones, nails, etc., as the repairers very often take the cables from the suspenders and leave them hanging on anything; (d) all the earth connections are secure, and that the cables are properly protected during blasting operations; (e) if there is a fall of roof the current should be immediately switched off, and not switched on again until the cable has been thoroughly examined and tested.

(To be continued.)

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*Read before the Association of Mining Electrical Engineers (South Wales Branch).

Commerce and Industries.

£37,500,000 Coing Begging.

It is noted in the report of the Union Labour Bureau, as indicating the splendid chance open to South African farmers, that prior to the war the European countries involved exported to the United Kingdom close on £37,500,000 worth of farm produce annually. This included: Butter, £5,200,000; corn and grain, £11,500,000; eggs, £4,750,000; fruit, £1,500,000; potatoes and vegetables, £1,050,000; sugar, £12,500,000; tobacco, £350,000; and raisins, £800,000. The report proceeds: "As a state of armed neutrality exists in nearly all other European States, it is obvious that they are all conserving their food production as much as possible. It is equally evident that the waste and destruction of crops on the scenes of hostilities, the withdrawal of so many men from agricultural pursuits, and the crippled conditions under which these will be resumed afford opportunities to the agriculturists of the Union which have never been more favourable. Markets for our produce must remain good for long after this devastating war is over. Prior to the war, leather was exported from Germany to the United Kingdom to the value of over two millions sterling annually. Hides from South Africa formed a considerable proportion of this large supply of leather, for the tanning of which wattle bark was also exported from this country." For the rest, the reports on the several trades and occupations show little change, except that Christmas calls materially assisted printers, lithographers, confectioners, and the like, and that Defence Force calls helped wagonmakers, blacksmiths, sheet-metal and leather workers. Dulness brooded over other lines. "Nevertheless," says the report, "the Union is probably more free from acute distress than any of the other countries which are active participants in the war."

* * * *

The Latest Durban Loan.

The Town Council of the Borough of Durban recently invited applications for the purchase at par of £350,000 of five per cent registered stock, repayable in 1929. A bonus equal to three months' interest will be paid on 31st March 1915, On 30th June, 1915, one half year's interest will also be paid. Thereafter interest will be paid half-yearly. The loan is for the purpose of extensions of water supply, electric lighting, tramways, telephone, sewerage, storm water drainage, ocean beach and other public improvements. The stock will form a charge upon the rents, rates and general revenue of the borough. The prospectus states that the issue is the first instalment of a loan of £960,000. The total loans raised are £3,404,000, of which £104,000 have been redeemed on the dates of maturity, leaving the present loan debt at £3,300,000. Over 50 per cent. represents the capital of the various trading undertakings owned by the municipality. The trade profit of these undertakings for last year, capitalised on a 4 per cent. basis, would be sufficient to liquidate the whole debt of the borough and leave a surplus of £310,532. The list closed on the 16th inst.

* * * *

Union Labour Returns.

A hopeful note runs through the report of the Government White Labour Department for December, though the statistics compiled afford little concrete proof of improvement in trade and industry. Applications for employment registered at Johannesburg, Pretoria and Capetown declined from 637 in November to 493 last month, but the number for whom employment was found fell from 218 to 112, and applications from employers fell from 327 to 165. The splendid success of the Durban Municipal loan, however, is likely to cause a radical change, for it is to be spent in numerous productive public improvements of a kind which employ a high ratio of labour to the amount absorbed by plant and material. Stagnation still prevails in the building trade. The nine principal municipalities in the Transvaal only passed plans for works totalling £24,934, as against £27,333 in November. Eight Cape municipalities approved a total of £4,723, and Durban £15,343, the grand total being less than Johannesburg normally deals with alone. The Johannesburg Bureau notes that the Government accepted tenders for buildings to the value of £9,092 not included in the municipal returns. Commenting on the figures the same authority says that all trades allied with the building remained extremely dull, and that an unusual number of masons and painters registered themselves for employment. Capetown reports similarly, and so does Durban, with the saving clause that a number of new works are contemplated, and that January should show an improvement. A building scheme is shortly to be undertaken in West Street, which is expected to employ a fair number of men. Throughout the Union the number of white employees on mines and works decreased by 962, but the Rand only accounted for some 120, or about 12 per cent. of the total. Coloured labour in this field dropped 4,992, the Rand losing over 93 per cent. of the total. These figures imply that the ratio of white to coloured rose, and the report states that good miners have no difficulty in finding employment.- Disappointment is expressed by the Johannesburg Bureau at the absence of an increased demand for farm hands.

* * * *

Portuguese East African Trade.

Among the imports into Portuguese East Africa the supply of which (reports the American Consul at Lourenço Marques) is affected by the European war may be mentioned: Arms and ammunition (the main item being cheap gas-pipe shotguns suitable for the Kafir trade); cotton prints (large quantities of which are needed for the Kafir trade, with present stocks short), electrical material, flour, furniture, Kafir hoes or picks, mouth organs, jew's harps,

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47—49, NATIONAL BANK BUILDINGS, SIMMONDS ST., JOHANNESBURG.
P.O. Box 2484. Telephone 5766. Telegrams: "PORTLAND."

WORKS:
VENTERSBURG ROAD, O.F.S.

accordions, whistles, etc., snuff-boxes, aluminium and brass wire, cheap jewellery, basins, mugs, candlesticks, celluloid goods, cheap perfumery, hatchets, hurrican lanterns, spoons, Kafir mirrors, combs, cheap socks, suspenders, enamelled ware of the grade known as seconds, galvanised iron in corrugated sheets (which is used almost universally throughout the Province for roofing and in many cases for fencing), railway rolling stock and materials, wines, beer, etc., smooth and barbed wire, and cheap blankets. As to the exports from the Province, the Consul stated that two thirds of the shipments had of late years gone to Germany. "If Germany as a purchaser is cut off for any length of time, the United States should benefit beyond any other country, as many of the crude products of Portuguese East Africa are not only in demand in the United States, but have been finding their way there via Hamburg. To be specific, in 1913 the Province produced $78,840 worth of mangrove bark. Of this total, $30,281 worth went direct to the United States and represented the total American imports from Portuguese East Africa during the year. It is probable that for some time to come all shipments of mangrove bark will go to the United States if transportation can be secured. Other items that should prove of special interest to American importers are copra, oil-producing nuts other than cocoanuts, whale oil, and wax."

Messina (Transvaal) Development.

The operations of this company for the month of December were as follows:—The mill ran 24·2 days and treated 7,570 tons of ore, equal to 313 tons per day, and produced 1,117·31 tons of concentrates of an average assay value of 39·2 per cent. copper. No. 1 smelting furnace operated throughout the month and treated 273 tons of middlings and vanner concentrates, and produced 157·5 tons of matte of an average assay value of 61·1 per cent. copper. The rainfall during the month was 10·23 inches on 20 days.

MINING INSTITUTE.

TEACHING CENTRES:—{ JOHANNESBURG AND SCHOOL OF MINES, KIMBERLEY.

Prof. YATES prepares candidates for the following Government Certificates:—
MINE MANAGER'S.
MINE OVERSEER'S.
MECHANICAL ENGINEER'S.
ELECTRICAL ENGINEER'S.
MINE SURVEYOR'S
by Class, Private Tuition, and Correspondence.

SOME 1914 RESULTS:—
MANAGERS - - - January and May - ALL Passed.
ELEC. ENGINEERS - February - - - - - 66% ,,
MECH. ENGINEERS - June (Kimberley Centre) - - ALL ,,
MINE OVERSEERS - - - - - Practically ALL ,,
NEARLY 200 SUCCESSES. St. James' Mansions, Eloff Street.

MINING MEN AND MATTERS.

Dr. J. Schlesinger, managing director of the New Transvaal Chemical Co., Ltd., sails this week for South Africa.

* * * *

Professor Yates opens the new season for mine managers' certificates this week-end, and enrolments are also being effected for the mechanical and electrical engineers' class. The attendance at these specialised courses continues to increase in a very satisfactory manner, which is hardly surprising in view of the remarkable successes which are being attained. We understand that the correspondence courses of the Institute are also expanding in a very marked manner and are being taken advantage of throughout the Union.

* * * *

The intimation appearing in the daily papers of Wednesday of the death in Cornwall of Mr. J. A. Hebbard was received with general regret on the West Rand, where he was well known and highly esteemed. He was appointed general manager of the Randfontein Estates in October, 1907, and held that position for about two years, subsequently taking a similar post on the Langlaagte Estate. He left for England about 18 months ago, and leaves a widow in Cornwall. Two of his sons are at present in this country, one being a mine captain on the Langlaagte Estate, and the other, it is understood, a cyanide manager on an East Rand mine.

* * * *

It is notified that the Commission of Examiners for mechanical and electrical engineers' certificates of competency will hold the next examination on Wednesday, Thursday, and Friday, the 24th, 25th, and 26th February, 1915, at 9.30 a.m., at the South African School of Mines and Technology, Eloff Street, Johannesburg, and also at Dundee, Bloemfontein, and Kimberley, if a sufficient number of candidates present themselves. Those wishing to enter for the examination must send in their applications to reach the secretary by the 10th February, 1915. The following syllabus of examination is published for information, and a detailed copy thereof will be supplied on application to the secretary:—Mechanical Engineers: Legal knowledge; strength of materials and design of structures; power plant; driven machinery and mechanical appliances; electro technics (elementary). Electrical Engineers: Legal knowledge; strength of materials, power plant, driven machinery and mechanical appliances, electro technics (advanced). Candidates for examination as mechanical or electrical engineers to take charge of machinery on mines will, in addition to the foregoing subjects, be examined in "mining plant."

Western Transvaal December Diamond Output.

The following is a list of the producing farms and their yield in the month of December:

	Carats.		Value.
Bloemhof	228½	....	£613 3 0
London	190¼	....	407 0 0
Panfontein	136¾	....	299 15 0
Cawood's Hope	120¼	....	227 17 6
Dievedraai	76½	....	141 4 0
Kameelkuil	29¼	....	93 10 0
Rieput	20	....	65 0 0
Kuilfontein	25½	....	44 2 6
Diamantdoorns	16½	....	38 10 0
Eastleigh	21	....	30 5 0
Kareepan	4¼	....	30 0 0
Modderkraal	14½	....	24 5 0
Christiana	14½	....	23 10 0
Kromellenboog	11½	....	18 2 6
Kareepan	5	....	9 10 0
Driekopjes	6½	....	7 10 0
Avondster	4	....	5 15 0
Homansvlei	1¼	....	3 5 0
Goedgenoeg	1	....	2 10 0
Mooifontein	¾	....	0 5 0
	927¾	....	£2,084 19 6

The complete year's output was as follows:

	Carats.		Value.
January	3064	....	£12,348
February	3838	....	16,167
March	3865	....	18,159
April	4196	....	18,415
May	4226	....	18,739
June	3549	....	15,985
July	4696	....	19,234
August	2277	....	6,623
September	2104	....	6,053
October	2068	....	5,389
November	833	....	1,949
December	928	....	2,085
	35644	....	£141,146

KILLARNEY OUTPUT.

The output from this digging for December amounted to 388½ carats valued at £829 5s.

Mines and General Trust.

The report of the Mines and General Trust, Ltd., for the year to October 31 last states that there have been no changes in the Trust's principal holdings, which include the following:—Auckland Park Real Estate, 43,205 £1 shares; Durban Navigation Collieries, 48,148 4s. shares; Fanti Consolidated Mines, 19,360 10s. shares; Prestea Block A, 10,000 £1 shares; and also 15 freehold building stands at Braamfontein let on short leases.

Municipality of Boksburg.

NOTICE No. 4 of 1915.

FOR SALE.

Tenders are hereby invited for the purchase of one 8/10 h.p. Vertical Boiler (second-hand), with pump, injector, and all necessary fittings; tested 100 lbs. pressure 19th August, 1913, and examined and found in good order on 7th August, 1914.

On view Lake Grounds at any time by appointment.

Sealed tenders, addressed to the Town Clerk, will be received up to 12 o'clock noon on Wednesday, 10th February, 1915.

H. J. BENNITT,
Town Clerk.

Municipal Offices, Boksburg,
28th January, 1915.

NEW MOTOR FUEL.

SOUTH AFRICAN ENTERPRISE.

According to an official statement just issued, a wonderful change in motor fuel has been made by the African Petrolex Company, Ltd., which has been floated with a capital of £70,000, of which £35,000 is working capital. The directors of the company are well known, and are as follows: Dr. F. E. T. Krause, K.C., Major John McMullen, B.A., M.B., B.Ch., R.U.I., C. A. Lagersen, Esq., and A. A. Boss, Esq.

For years efforts have been made to find an efficient substitute for petrol, the price of which has greatly retarded the use of internal combustion engines, but it is good news to hear that a more efficient fuel is to be manufactured at the astounding price of 3¾d. per gallon. It is estimated that at this price a profit of 48 per cent. can be made.

The inventor is a well-known analytical chemist, Mr. Finnis-Wheldon, F.C.S., a member of the Association of the Chemists of the Sugar Refineries and Distilleries of France and the Colonies, who has been engaged as chief chemist at one of the largest sugar factories near Durban for about twelve years, and is one of the leading authorities on all matters relating to the production of sugar from cane. He has been able to devote great attention to the question of obtaining an efficient motor spirit from molasses, and the result of his labours we have in "Petrolex."

The company has been formed to take over from the vendor certain secret formulæ for the manufacture of Petrolex and other by-products from molasses, and certain contracts entered into with Natal sugar mills for the whole of their supply of molasses.

Tests are said to have shown Petrolex to be superior to petrol, and that it has a much wider range of use, it having a great efficiency for all kinds of motor engines and being unsurpassed as an illuminant, whilst among the by-products are perfumery, liqueurs, spirits, fertilisers, etc.

The valuable rights of the secret formulæ for the manufacture of Petrolex have been secured for the company, and it is intended to arrange for subsidiary companies to be formed in other parts of the world, so that the possibilities of the company appear to be immense.

It is claimed that Petrolex being more efficient than petrol, there will be a considerable saving in cost and also economy in the space required for storage, whilst the reduction in weight of fuel for land or sea journeys will be of great importance.

The company proposes to erect a distillery with a capacity of 525,000 gallons of Petrolex per annum, equal to 65,625 cases of 8 gallons each.

There is no question that steam engines are being gradually superseded by internal combustion engines, so that, apart from the vast quantities of spirit fuel required for motor cars, a still greater quantity will be in demand for stationary and locomotive engines, also for the various navies and mercantile fleets, which directly sufficient spirit fuel is obtainable, will prefer the more economical internal combustion engine. The market for a cheap and efficient liquid fuel is practically unlimited, and, inasmuch as Petrolex is cheaper and, at the same time, a more efficient fuel than petrol, it follows that the demand for Petrolex should rapidly supplant the present demand for Petrol.

It is difficult to conceive any enterprise which to-day offers a larger or more lucrative field for investors than that offered by the manufacture and sale of a cheap and efficient motor fuel. We understand that tests have been made in Johannesburg with a 20-30 h.p. Auburn motor car and a 3½ h.p. B.S.A. motor cycle. In each trial the test was made without any change of adjustment whatever. The results, we are informed, proved conclusively that Petrolex is the most efficient motor fuel that has yet been known, and we wish it every success.—Advt.

THE WEEK IN THE SHAREMARKET.

Quiet with Few Features—Zaaiplaats More Active—Gold Stocks Firm.

No very great amount of business was done during the week, the improvement in the price of Zaaiplaats being the only feature. Rooibergs did not share in the re-awakened interest in tin, and gold stocks were quiet in view of the promised new taxation. Government Areas were firmer and Modder Deeps shared the little public interest displayed. The week's fluctuations are shown below:—

	Fri., 22nd.	Sat., 23rd.	Mon., 25th.	Tues., 26th.	Wed., 27th.	Thurs., 28th.
Adair Ushers ..	—	0 3*	0 4*	0 3*	0 4*	0 4*
African Farms ...	8 6	8 6*	8 6*	8 6*	8 9†	8 6*
Apex Mines ..	12 9*	12 9*	12 9	12 0*	12 0*	12 0*
Aurora Wests ..	—	—	—	10 0†	—	—
Bantjes Consolidated	8 0*	8 3*	8 3*	—	—	—
Brakpan Mines ..	46 0	46 0*	46 0	—	46 6	46 0*
Breyten Collieries..	—	20 0*	—	20 0*	20 0*	20 0*
Bushveld Tins ..	—	0 5*	0 5*	0 4*	0 4*	—
Cassel Coals ..	—	15 0†	—	—	—	—
City & Suburbans..	40 6*	40 6*	40 6*	40 6*	40 6*	40 9*
City Deeps.. ..	57 0*	57 0*	57 0*	—	57 0*	57 0*
Cloverfield Mines ..	4 0*	4 1*	4 0*	4 1*	4 2*	4 1*
Clydesdale Collieries	8 0*	8 0*	8 0*	8 0*	8 0*	—
Con. Langlaagtes. ..	32 0*	32 0*	32 0*	32 0*	32 9†	31 6*
Con. Main Reefs ..	16 9*	16 9*	17 0†	16 9*	16 9*	16 6*
Coronation Colls. ..	21 3*	21 0*	21 0*	21 0*	21 0*	21 0*
Coronation Freehds.	—	0 3*	0 3*	0 3*	0 3*	—
Crown Mines ..	75 0*	—	—	—	—	71 0*
East Rand Centrals	2 2*	2 2*	2 2*	2 2*	—	2 0*
East Rand Coals ..	—	—	1 6*	1 5	1 4*	1 4*
East Rand Deeps ..	1 4*	1 5*	1 5*	1 5*	1 4*	1 4*
East Rand Props. .	27 9*	29 0*	27 6*	27 6*	28 6†	28 6†
East Rand Debs. ..	—	£90†	—	£85*	—	—
Eastern Golds ..	1 0*	1 1*	1 1*	1 1*	1 2	1 1*
Ferreira Deeps ..	—	—	—	—	41 0*	41 0*
Frank Smith Diam.	1 4*	1 5	1 4*	1 4*	1 4*	—
Geduld Props. ..	21 0*	21 3*	21 3	21 3*	21 3*	21 3
Glencairns	—	1 0*	1 0*	1 0*	—	1 0*
Glencoe Collieries ..	5 9*	5 9*	5 9*	5 9*	5 9*	5 9*
Glynn's Lydenburgs	10 0*	10 0*	10 0*	10 0*	—	11 0†
Government Areas	17 3*	17 6	17 3	17 3	17 3*	17 0
Jupiters	4 0†	—	3 0*	3 0*	4 0†	4 0†
Kaalfontein Diam...	0 3*	0 3*	—	0 3*	0 3*	0 3*
Klerksdorp Props.	2 9†	2 9†	—	2 9†	—	—
Knight Centrals ...	5 6*	5 7*	5 6*	5 6*	5 6*	5 6*
Knights Deep ..	—	24 6*	—	30 0†	28 0†	—
Lace Props. ..	3 0*	3 0*	—	3 0*	3 0*	3 0*
Langlaagte Estates.	—	—	15 0*	—	20 0†	—
Luipaardsvlei Est.	7 6*	—	7 0*	10 0†	7 0*	7 0*
Lydenburg Farms	2 6*	2 6*	2 6*	2 6*	2 6*	2 6*
Meyer & Charltons	—	87 6*	—	—	—	—
Middlevlei Est. ..	1 3*	1 6†	1 0*	1 2*	1 6†	1 1*
Modder B.'s ..	85 0*	85 0*	—	—	85 6*	85 0*
Modder Deeps ..	61 0	60 0	59 0	59 6*	59 9	61 3
New Era Cons. ..	5 0*	5 0*	5 0*	5 0*	5 0*	5 0*
New Geduld Deeps	1 9*	1 9*	1 9*	1 9*	1 9*	1 9*
New Gochs ..	12 6*	12 9*	12 6*	12 9*	12 9*	12 9*
New Heriots ..	—	57 6*	—	58 0*	59 0*	—
New Kleinfonteins	19 6*	19 6*	19 6	19 3*	19 0*	19 3
New Modderfonteins	255 0†	251 3*	—	255 0†	250 0*	255 0†
New Unifieds ..	18 0*	18 3*	18 3*	20 0†	18 0*	20 0†
Orange Diamonds	0 9	—	0 9*	0 9*	0 9*	0 9*
Pretoria Cements ..	40 6*	42 0*	42 6*	42 0*	42 6*	43 0
Princess Estates ..	—	—	—	—	1 0*	—
Rand Klips ..	2 10*	2 11*	2 10*	2 11*	2 11*	2 11*
Rand Nucleus ..	1 5*	1 5*	1 5*	1 5*	1 5*	1 7†
Randfontein Deeps	2 10*	3 0†	2 11*	2 10*	2 10*	2 10*
Randfontein Est. ..	17 0†	15 6*	16 0*	16 0	16 0*	16 0*
Rooibergs	—	18 9*	—	19 6†	19 0	19 6†
Roodepoort Uniteds	6 0†	6 0†	6 0†	6 0†	6 0†	6 0†
Rose Deeps ..	—	—	—	—	42 6†	—
Ryan Nigels ..	1 0*	—	—	—	—	—
Shebas	—	3 0†	3 0†	2 0*	2 0*	2 0*
Simmer Deeps ..	1 6*	—	1 6*	1 6*	1 6*	1 6*
S.A. Lands ..	2 4*	2 4*	2 4*	2 4*	2 4*	2 4*
Springs Mines ..	13 3*	13 9	13 6	13 6*	13 6	13 3
Sub-Nigels	9 0*	9 0*	9 0*	9 0*	9 3*	9 0*
Swaziland Tins ..	20 0*	20 0*	20 0*	20 0*	20 0*	20 0*
Transvaal Coal Trust	29 0*	30 6*	31 6	31 0*	31 6†	31 9†
Trans. G.M. Est. ..	—	—	—	—	31 0*	—
Van Ryn Deeps ..	45 6*	45 9*	45 6*	45 6*	45 6	45 6*
Village Deeps ..	—	—	—	—	36 0†	—
Western Rand Est.	—	1 6†	—	1 6†	1 6†	—
Witwatersrands ..	59 0*	61 0	60 6	59 0*	59 6*	59 0*
Witwatersrand Deeps	—	37 6†	37 0†	36 6*	37 6†	37 0†
Wolhuters	12 3*	12 3*	12 3*	12 3*	12 3*	12 3*
Zaaiplaats Tins ..	20 6*	21 0	21 0*	21 6*	22 6	23 6

*Buyers. †Sellers.

ANSWERS TO CORRESPONDENTS.

"Engineer."—Too personal, and probably libellous.

"R.J." and "Critic."—Too personal.

"Shareholder."—Held till next week.

PRETORIA PORTLAND CEMENT
COMPANY, LIMITED (Incorporated in the Transvaal), Established 1892.
Largest and oldest established Manufacturers of Portland Cement in South Africa.
OUTPUT OVER ONE MILLION BAGS PER ANNUM.
Contractors to the Union Government, South African Railways, Johannesburg, Pretoria, Bloemfontein, Capetown, Durban and other important Municipalities, Irrigation Boards, Mining Companies, etc., etc.
"PRETORIA" PORTLAND CEMENT, QUALITY UNSURPASSED.
Every bag guaranteed to pass the full requirements of the British Standard Specification.
REMEMBER: Our guarantee is backed by over 20 years' experience of South African conditions
PROCURABLE FROM ALL MERCHANTS IN SOUTH AFRICA.
Sales Office, JOHANNESBURG: 131-132, CULLINAN BUILDINGS.
Telephone No. 5890. P.O. Box 3811. Telegrams: "CEMENT."

The Week's Company Meetings.

WITBANK COLLIERY, LTD.

Annual Meeting.

Satisfactory Showing.

Shortage of Railway Trucks.

The annual meeting of shareholders of the Witbank Colliery, Ltd., was held last week in the board-room, Cullinan Buildings. Mr. W. H. Dawe presided, and there were also present Messrs. A. G. Gill, P. Dreyfus, R. Goldmann, J. H. Ryan, J. Jeppe, G. C. Fitzpatrick, and A. Gregor, acting secretary, representing 73,884 shares out of an issue of 210,000.

Chairman's Speech.

The Chairman said: In moving the adoption of the directors' report and the financial statements for the year ended 31st August, 1914, I have the pleasure to once again refer to the satisfactory nature of the information submitted to you. The past year was not free from anxiety, as we had to cope with the industrial disturbance in January, 1914; but, fortunately, any difficulties which arose were satisfactorily dealt with.

The financial position, as on the 31st August last, is summarised in the directors' report, where it is shown that the total to the credit of appropriation account amounted to £138,135, from which we have to deduct the sum of £61,477, carrying forward a balance of £76,658, as against the credit balance brought forward from the previous year of £57,358. Two dividends of 12½ per cent. each were declared for the past year, and these absorbed the sum of £52,500. These dividends together equalled the amount declared for the previous financial year, namely, 25 per cent. In regard to capital expenditure, the sum of £771 was expended on buildings on the Witbank property, and £5,288 on account of machinery and plant, the various items of which are detailed in the general manager's report; in addition to these amounts £11,377 was expended on the equipment of the Uitspan Mine. In connection with the equipment, particularly at Uitspan, I mentioned at the last annual meeting that it was necessary to add to the then existing plant in order to be able to maintain the output as hitherto as a result of the reduction in the working hours of the miners in the Transvaal collieries. No special provision has yet been made for the expenditure on the equipment of the Uitspan Mine, the amount of which is shown in the balance sheet now submitted to you at £38,461. The other items of capital expenditure were in connection with shares in the Rand Mutual Assurance Corporation, Ltd., and the Transvaal Coal Owners' Association, Ltd. On the other side of the account, we received the sum of £2,313 from the sale of stands in the Witbank Township, and sundry other items. In regard to the credit balance brought forward, I need hardly remind you that sundry liquid assets are included in this amount, the actual cash balance at the end of the financial year being £43,716.

Tar and Plant.

At last annual meeting I mentioned that the Johannesburg Town Council had commenced an action against your company for damages in connection with the contract we entered into on the 2nd November, 1909, for supply of tar to that Corporation, and from the directors' report now under consideration you will have gathered that, since the close of the financial year, your directors agreed to a compromise whereby the company paid the Town Council the sum of £10,000 in full settlement of its claim, each side paying its own costs. As this question has been settled, nothing is to be gained in entering into an unnecessarily long statement of the case; at the same time I think it is due to you that I should briefly refer to the more important points. Originally a contract for a comparatively small quantity of tar was entered into with the Town Council, and the plant provided came up to expectations, with the result that the Council desired to be supplied with a larger quantity of tar than your company agreed to supply under the first contract. Your board accepted a contract for an extended period, and increased the plant; unfortunately, the increased plant never produced either the quantity or the quality stipulated for in the specification. Our chief source of trouble was the disappearance of the small bituminous seam, which evidently was of the greatest value in producing the tar. Our second difficulty was the fact that we had started what was practically a new industry, and that our plant was designed to produce tar alone, whereas I understand in every other case tar is simply a by-product.

Best Technical Advice.

Your directors did everything in their power to make the undertaking a success, by obtaining the best technical advice they could get, and by engaging a man with expert knowledge from Europe to take charge of the plant. Our efforts did not meet with success, and ultimately we were obliged to ask the Council to cancel the contract. Your board was quite prepared to pay the Council a substantial sum as compensation for the non-fulfilment of the contract, and expected that as they had honestly striven to meet their engagement, and bring what was a new industry in this country to a successful issue, the Council would have treated your company with some consideration. In this assumption, however, they were totally mistaken, as the Council instituted proceedings for damages to the extent of £14,070—that is, for the utmost they could claim. Having been met in this manner, your board submitted its case to one of the most eminent technical authorities in England, and, on a technical point, received a most reassuring opinion. In view, however, of the fact that had the case come into Court the expenses incurred would have been very heavy, as technical advisers from England would have had to have been engaged, and also in view of the uncertainty which exists when submitting a point of this nature to a Court of Law, your directors decided that it would be better to close the matter by accepting the compromise offered by the Council, namely, that the company should pay the sum of £10,000.

Coal Output.

The output of coal during the financial year amounted to 775,906 tons—that is, an increase of 19,275 tons on the production of the previous year. This result your consulting engineer refers to as satisfactory, when the fact is taken into account that, owing to the shortage of railway trucks, and the strike in January last, the working time was 6.3 days less than during the previous year. I am glad to say that the quality and width of the seams of coal continue to be satisfactory at both mines, and that, owing to the duplication of the screening and sorting equipment of the Uitspan mine, that portion of the property gave an increased output of 25,372 tons.

There is one point referred to by the consulting engineer which I wish to deal with at somewhat greater length. This reference is to the shortage of railway trucks, which seriously affected the regular, and, consequently, the most economical and efficient working of the mine. At the last annual meeting I informed you that this question of the shortage of trucks had been very fully discussed, and had received the fullest consideration of the Railway Administration and the Transvaal Coal Owners' Association, and that the outcome of the discussions which had taken place was an assurance from the Minister that the question would receive immediate attention, and that he anticipated there would be no cause of complaint in the future. I also added that, since receiving that assurance from the Minister, there had been a sufficient supply of trucks. Unfortunately that state of affairs did not continue for any length of time, and I think I am quite right in saying that during the past year your company has suffered as much, if not more, from shortage of trucks than it has since this question was first brought under discussion, which was some ten or twelve years ago. An irregular supply of trucks is bound to have a serious adverse effect on the general working conditions of the colliery. The natives employed have to be paid for a full shift whether they are kept at work for the full period of the shift or not; consequently frequent stoppages constitute a dead loss to your company, and, indirectly, a further loss through inefficiency caused by interruptions.

Suggestion of Bunkers.

To meet the difficulty the Railway authorities suggested that the collieries should provide adequate bunkers. This means that the collieries are asked to incur heavy capital expenditure for bunkers, instead of the Railway Department incurring expenditure for additional rolling stock. But, apart from this aspect of the case, the provision of bunkers would not solve the difficulty, as, in the first place, these bunkers could only have a very limited capacity, and, secondly, the additional handling of the coal would prove detrimental to its quality. I wish to make it quite clear that in my opinion the Railway Administration does all in its power to minimise the inconvenience arising from this want of an adequate supply of rolling stock as much as possible, but naturally the Administration cannot be expected to achieve an impossible task. The question is not one of administration, but of policy—a policy which to the ordinary layman is inexplicable, in that it obviously means a serious loss of revenue to the country.

Since the last annual meeting Mr. S. C. Thomson, who was for many years the consulting engineer of your company, resigned the position on leaving Johannesburg. Your board fully appreciated the valuable work he did in connection with the development of the property. Mr. D. Wilkinson, who has had a long experience of mining conditions in this country, was appointed in Mr. Thomson's place, and on behalf of your directors I have to express the appreciation of the services rendered during the past financial year by the consulting engineer, the manager and staff.

I now beg to formally move the adoption of the reports and accounts, as submitted.

The report and accounts were adopted.

Messrs. C. S. Goldmann, H. J. King, and J. Jeppe were re-elected directors, and Messrs. C. L. Andersson and Co. and J. P. Ablett were re-appointed auditors.

Transvaal G.M. Estates.

The following cablegram has been despatched to the London office of the Transvaal Gold Mining Estates, Ltd.: "Excessive rain continuing, about 18 inches to date this month, interrupting power supply and increasing damage mines. Graskop Mine inaccessible. All transport most difficult. Reef 21 inches 8·5 dwts. struck below main drive to dip northern section Peach Tree Mine after long stretch barren ground indicating possibility extension Duke's Hill payable zone to this section Peach Tree in depth."

Manicaland Output.

The mineral output of the Territory of the Companhia de Moçambique (Manicaland) for the month of December, 1914, is as follows:—Reef: Mill: Gold won (fine), 240 ozs. 14 dwts. 5 grs.; tons crushed, 653, value £997 15s. 11d. Concentrates (estimated): Gold (fine), 8 ozs.; tons, 4, value £33 12s.; also contains silver and lead, value £20 4s. 7d. Alluvial: Gold recovered (fine), 941 ozs. 12 dwts. 14 grs.; cubic metres treated, 85,000; value, £3,903 8s. 8d.

Arkansas Diamonds.

The Arkansas diamond field received more active development in 1913 than in any previous year. The nature of the work was not such as to definitely prove or disprove the value of the deposits. Two washing plants were built, one by the Ozark Diamond Mining Corporation on their holdings at the north-east side of the original peridotite area, and the other by the Kimberlite Diamond Mining and Washing Company, on the west side of Prairie creek.

Australia and German Trade.

A Melbourne telegram to an Australian newspaper states that an anti-German League, to be formed in Melbourne, is assured of good support. Its object is to prevent trade with the enemy, and information will be obtained on the following points:—(a) The source from which their tradesmen obtain their goods; (b) the nationality of the proprietors, managers, and employees of firms; (c) the nationality of local agents for British firms; (d) what German or Austrian firms are trading under English names. The League hopes to gain the co-operation of the British Board of Trade. It intends to encourage in every possible way the purchase of Australian products.

Legal Decisions Affecting Mining.

WATER RIGHT CONTESTED.

Judgment was given by Mr. Justice Bristowe in the Rand Division of the Supreme Court this week on the exceptions raised by defendants to the declaration of the plaintiff in an action instituted by the liquidator of the Langlaagte Proprietary Mines, Ltd., against the Crown Mines, Ltd., and the Mining Commissioner of Johannesburg. The action is to have a certain water right recently granted under the Gold Law to the Crown Mines by the Mining Commissioner, set aside and declared to be null and void on the ground that the Mining Commissioner had no jurisdiction to make the grant, and for an order to restraining a bezitrecht in respect of such water right. After discussing the legal points raised, his lordship decided against the exception that the declaration "was vague, embarrassing and bad in law and disclosed no cause of action." The exception was, therefore, dismissed with costs. Leave to appeal was granted.

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THE SOUTH AFRICAN

Mining Journal,

WITH WHICH IS INCORPORATED

South African Mines, Commerce and Industries.

ESTABLISHED 1891.

VOL. XXIV., PART I.] FEBRUARY 6, 1915. [No. 1219.

HEAD OFFICE: 176-180, Stock Exchange Buildings, Fox Street (2nd Floor), Johannesburg, Union of South Africa.

Telephone **913.** P.O. Boxes **963** and **418.**

Cable and Telegraphic Address: "**MINING JOURNAL.**"

AGENTS FOR GREAT BRITAIN: Argus Printing and Publishing Co., Ltd., Byron House, 82-85, Fleet Street, London, E.C.

AMERICA: Advertisements accepted from any recognised Advertisement Agency.

ANNUAL SUBSCRIPTION RATES: Oversea, £2; South Africa (by post), £1 10s.; Local Delivery (Town only), £1 6s.

Copies of this journal are obtainable at all Branches and Agencies of the Central News Agency, Ltd., at all News Agents and Railway Bookstalls throughout South Africa, and at the London Agency as above.

NOTICE.—The postage of this issue of the *S.A. Mining Journal* is: South Africa, 1d. All other parts, 1½d.

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Notes and News.

Modderfontein Deep Levels.

The following particulars were cabled to the London office of the Modderfontein Deep Levels, Ltd., yesterday:—"Trial crushing started on the 14th of December and during that month the whole of the reduction works was thoroughly tested and proved satisfactory. Since the 1st of January the entire plant has been running constantly, the tonnage crushed for the month—including 2,326 tons from the dump—amounting to 25,750 tons of about 9 dwts. grade. The tonnage completely treated was naturally much less and a large quantity of gold has been absorbed in the plant. Further, in order to put the plant in good condition, only a partial clean-up was made. The total gold recovered was 8,105 ozs., value £34,345. Costs amounted to £26,383, and the profit inclusive of sundry revenue was £8,030."

* * * *

Dividend Distributions.

With reference to the declarations of dividends by the Rand Mines—Central Mining companies on 12th December last, in which it was notified that they might be payable a little later than the usual date, notice is now given that warrants in payment of those dividends will be posted to South African registered shareholders from the Head office, Johannesburg, and to European shareholders (except those resident in the territories of enemies) from the London office, 1, London Wall Buildings, London, E.C., on the 22nd February, 1915. Holders of share warrants are informed that they will receive payment on the 23rd February, 1915, for the coupons in respect of the above dividends at the London office of the company, or at the Crédit Mobilier Français, 30 and 32, Rue Taitbout, Paris, where permissible, as specified in each company's official declaration of dividend.

* * * *

Central Mining Directors Resign.

We are officially informed that Mr. Eckstein and Mr. Louis Reyersbach have resigned their seats on the board of the Central Mining and Investment Corporation, Ltd. Sir Lionel Phillips, Bart., who is now in London, has temporarily accepted the chairmanship vacated by Mr. F. Eckstein. It will, therefore, be a few months before Sir Lionel can return to South Africa. Mr. Raymond W. Schumacher, who is leaving Johannesburg for health reasons about next May, will remain a director of the corporation.

* * * *

Haenertsburg Gold.

Attention is drawn to the notice in our advertising columns to the effect that the first ordinary general meeting of shareholders in the Haenertsburg Gold and Copper, Ltd., will be held in the Grand National Hotel, Rissik Street, Johannesburg, on Monday, 8th February, at 8 p.m., to receive the directors' report and accounts for the period from the inception of the company to 31st December, 1914; for general business; and to elect directors in the place of W. Holman James, Colonel E. O. Hutchinson, and Herbert Moss, who retire in accordance with the provisions of the articles of association, but are eligible and offer themselves for re-election, and to fix their remuneration for past services.

* * * *

Victoria Falls and Transvaal Power.

A circular has been issued to the shareholders of the Victoria Falls and Transvaal Power Company stating that business since the last report has continued to make satisfactory progress, the war not having interfered with the undertaking in South Africa. The amount of power now being delivered shows an increase over that of June last. That is reflected in profits, which show a steady increase since the beginning of last year. In connection with the erection of new plant at Brakpan the first set [illegible] will be in commission within a month, and the second set will be available for service two months later. Fresh demands for power requirements are being received.

Rooiberg Position.

In the three months ended December 31, the Rooiberg Co. earned £4,689, an average price of £135 6s. per ton of metallic tin being assumed. No allowance is made for the rise that has since taken place. Number of stamps running, 10; number of days run, 76·068; tons treated—from mine 6,785, sands and slimes re-treated 2,524, total 9,309 short tons; concentrates produced, 250 long tons; accumulated tonnage of middlings and slimes not yet re-treated, 3,542 short tons; estimated average assay value, 2·5 %, M.T. The expenditure for the quarter was £2,049 17s. 4d. No development work has been carried out during the quarter below the 210ft. level. Prospecting on the surface and at shallow depth has been continued with satisfactory results. A dividend (No. 8) of 5 per cent. (equal to one shilling per share) has been declared payable to shareholders registered in the books of the company on 31st December, 1914. During November an engagement between the Government forces and a rebel commando took place near the mine. One of the company's employees was killed while assisting the Government forces. The mine recreation hall was turned into an hospital, and the other resources of the company were placed at the disposal of the Commandant of the forces. No damage was done to the company's property, and the operations were affected only to a slight degree. The thanks of the Government have been conveyed to the Manager, Medical Officer, employees and ladies on the property for the services rendered in succouring and nursing the wounded. The metal markets are again open, and although the price of tin is comparatively low, there is a ready demand for the company's concentrates.

* * * *

Miners' Union Deputation to Minister of Mines.

A Mine Workers' Union deputation had a conference last week with the Minister of Mines and the Government Mining Engineer. The deputation alleged some miners were still being victimised over the July and January strikes, and asked for representation on the Miners' Phthisis Board, and that the Miners' Office should be notified of mine accidents. Mr. Malan discussed all the points sympathetically, and mentioned that the new Phthisis Board would be formed in a few months, and that the miners' views in regard to representation would receive consideration. He undertook the Miners' Office should be notified of serious mine accidents, and discussed with the deputation the question of releasing the men sent to prison during the strike period.

* * * *

Zinc and the War.

The present position of the base metal industry, owing to the war, is a matter that calls for immediate attention. The production of copper and zinc—one used largely in electrical work and the other essential to certain mining operations—has been almost entirely a German monopoly. The great smelting works of Germany have bought up copper and zinc ores from everywhere, and have supplied the world with the pure metals. There is no reason why large smelting works should not be established in England, and that country become the source of supply for the world. The enterprise is already projected, the necessary large capital is available, and only one thing stands in the way. The obstacle is exemplified by the position of the Broken Hill companies. Some, if not all of them are under contract to sell all their zinc ore to German firms up till 1919. During the war they cannot sell to Germany; and, if held to the strict letter of their contracts, they can sell to no one else. Then, when peace is declared, the owners of the German smelting works will resume their lucrative trade as if nothing had happened. Obviously, unless the zinc industry is to be paralysed during the war and to revert to the German monopolists at the close of it, there is only one course to pursue. That course was pointed out two or three weeks ago by a London financial paper, which said that the British Government ought to declare all such contracts entered into within the Empire to be absolutely void, not merely suspended during the continuance of the war, and to close the British Courts to any application that might subsequently be made for their enforcement. Smelting works in order to sell their product at a reasonable price and yet pay, must be run constantly, and must treat large quantities of ore. This, of course, demands the outlay of considerable capital and until the Courts give the desired security nothing may be done. One other possibility, however, may be indicated. A rising young electro-chemical engineer has patented a process for the electrical precipitation of zinc from its ores, and should the method prove as successful on a large scale as it has in its laboratory tests, a great future may be predicted for it. Incidentally, British capitalists, before embarking enormous sums of money in erecting zinc smelters, should satisfy themselves regarding the process in question. It may also be mentioned that the electric furnace is being successfully used in the zinc industry in Norway, Sweden and Finland, while much skilful experimenting has been done in America. In 1913, 4,000 horse-power was being used in producing zinc in Scandinavia, and 7,000 horse-power has been added since then. The firms are very reticent about their methods; in fact, there are no reliable published data about their present type of furnace.

* * * *

Finance at the Half-Capital.

The large amounts recently subscribed in Capetown to various South African loans have greatly surprised many people, more especially those not closely in touch with financial affairs. In 1913 the City Treasurer (Mr. C. B. Martin) called attention in his annual report to the fact that the Mother City had become the investment centre of South Africa, and that from 1905 onwards Capetown had been financed by means of local loans, without the municipal authorities having to have recourse to the London market. It is as true to-day as it was two years ago that in the Peninsula funds are always available for investment in gilt-edged securities. In spite of the war, Capetown is in a very strong position financially. Within the last six months the Peninsula Municipal Council has borrowed to the extent of £174,100, by far the greatest proportion of which has been obtained locally. Then, during the past few weeks, the Capetown public has taken up £100,000 of the two Durban loans, and one financial institution has advanced £15,000 to the Worcester Municipality. In addition, Peninsula investors have contributed very largely to the loan of £400,000 raised by the Zak River Estates. The total of these borrowings is £689,000—substantial proof of the faith of the public in the future of the Union and of the soundness of the financial situation in the Peninsula.

* * * *

Swazi Goldfields.

The report of the directors of the Swazi Goldfields states that expenditure has been confined to the bare needs of maintaining the company's concession, amounting for the twelve months ended October 31, 1914, to £76 15s. All directors' fees have been waived. The demand made by the Swaziland Administration upon the company, referred to in the previous annual report, has been reduced, upon the sub-division of the original concession as between the company and the Henderson Consolidated Corporation to £803, of which £319 is payable immediately, and the balance in eight equal yearly instalments with interest at 4 per cent. per annum. It would appear that there is no alternative but to pay the amounts demanded.

* * * *

Copper Supplies from the Belgian Congo.

The steamer *York Castle* recently arrived at Swansea with 2,000 tons of copper slabs from Beira, the first such consignment from that port to Swansea. The copper came from the Belgian Congo. Previous to the outbreak of war most of the copper from the Belgian territory was bought by Germany, and last year one mine alone produced 12,000 tons. The war has stopped this trade, and to-day England is receiving the copper. The copper produced from the beginning of the year was realised at a price which shows a profit of approximately £20 per ton over the cost delivered in England. The copper produced and landed in England since the outbreak of war has been sold at a profit of over £10 per ton. A considerable increase will now be secured, and as the price of copper is improving the Tanganyika Concessions, Ltd., is considering the immediate erection of two further blast furnaces, which have already arrived at Beira. Although considerable difficulties have been caused by the war, two furnaces have been kept running, producing 3,730 tons of copper up to the end of November. It is estimated that the company will produce 25,000 tons this year, and in 1916 40,000 tons.

* * * *

Dominions Royal Commission and S.A. Trade and Industry.

The Dominions Royal Commission, which visited this country last year to investigate natural resources, commerce, and trade legislation, has just issued the report of the evidence taken by its members in various parts of the Union. It is in two bulky volumes running into several hundred pages, and covering such subjects as emigration, land settlement, irrigation, mining, shipping, agriculture and allied industries, and general trade. While the witnesses were unanimous in the expression of their desire for closer trade and commercial relations between the Mother Country and the Dominions, but also between the Dominions themselves, there was the greatest diversity of opinion as to the means whereby the Empire's resources might be developed and inter-Imperial trade promoted. For instance, the Johannesburg Chamber of Commerce cordially agreed with the general proposition that it was desirable to appoint a permanent Executive Committee of the Imperial Conference to carry out the decisions of that Conference, and to provide for the continuity of its work, but when it came to the consideration of certain definite proposals for submission to that Executive Committee the Chamber was less pronounced in its opinions. Among these proposals were the two following:—(a) For the establishment of a Board and creation of a joint board fund for the general purposes of the development of the Empire and its resources; and (b) For a Board to assist in the raising of loans for development purposes, on the security of all Dominions. The Chamber doubted whether it would be practicable to carry these ideas into effect, "as the several Parliaments within the Empire would each require to exercise absolute control over their finances, and would be unable to delegate such matters to a representative on a Board operating in London." At the same time the witnesses who represented the Chamber before the Commission recognised that there were broad phases of trade that were common to all parts of the Empire, and they favoured the creation of a body that would care for trade in that sense. The suggested ways in which such a body might promote production and trade were almost as many as the witnesses themselves. The Commission was furnished with a great deal of first-hand information with regard to the natural resources of South Africa, both mineral and agricultural. In some forms of mineral wealth South Africa was shown to be easily at the head of the mineral producing countries of the world. The gold mines were colossal. On the Rand alone the total quantity of ore crushed up to the end of 1913 was 230,000,000 tons, yielding 90,000,000 fine ozs. of gold, of the total value of £382,585,000. This one industry in one district has paid dividends amounting to £96,270,000. With the 1914 figures the total value is over four hundred millions sterling and the dividends over a hundred millions. Moreover, the Commission was told by the Government Mining Engineer and other experts that, great as the Witwatersrand's past had been, it was destined to have a greater future. As against the 230 million tons already extracted from the mines which are now, or have been, in operation, one estimate puts the prospective yield from the existing mines and from new areas at 587 million tons; another, and wholly independent, calculation gave the potential yield as 550 million tons. Substantially, both agree in the conclusion that twice as much auriferous ore will be taken from this field as has been already extracted. Still another calculation extends to the gold contents of the ore yet to be mined, which is estimated at £1,300,000,000 sterling in value."

TOPICS OF THE WEEK.

THE INDUSTRY AND WAR TAXATION.

In view of the proposed war taxation on the mines, too much emphasis can hardly be laid on the lessons to be drawn from the globular figures of the recently-published mining returns for 1914. The value of minerals produced, exclusive of diamonds, during the year 1914 was £39,139,363 (gold £35,664,230, coal £2,225,041, base minerals £1,147,659). The diamond production to 30th June was valued at £4,500,000, the month to the cessation of operations on the same basis would add £750,000. The total yield for the year would thus approximate £44,400,000, as against £52,925,000 in 1913 and £52,712,000 in 1912. For the Rand alone, it may be repeated, the total tonnage crushed was a little higher than for 1913. Output, profits, dividends, and total cost of production were, however, all a little lower, the figures for the last-named being £21,943,000 as against £22,938,000. It is not yet possible to say to what extent the saving has affected wages and expenditure on mine supplies. The other figures were analysed sufficiently in our last issue. It only remains to note, in regard to them, that 1912 is still the record year for the Rand in respect of total output and profits, and 1909 the best year for dividends, the total of £9,301,751 then distributed not having been equalled since or before. What the industry means to the country is best left to the unbiassed testimony of the Secretary of the Department of Mines and Industries. In dealing with the subject last year he wrote: "It is difficult to show exactly what percentage of the value of the total mineral output is spent within the Union itself. Complaints are frequently made that the mining industry is exploiting a wasting asset of the country, for which the country is getting no return. Such statements can surely only be made under a misconception. The percentage actually going to investors who have lent us the capital to open up our mines is, when examined, a comparatively small portion of the total won from the earth. Taking the Witwatersrand gold mines, out of the total output of just under 35½ millions, the following amounts were paid in wages and salaries in 1913:—Whites, £7,537,101; coloured, £5,340,661; and in stores, £10,128,800, while over £1,000,000 was paid in direct taxation to the Government. Thus of the gold exported from the Rand 21 per cent. comes back and is paid out to whites in the employ of the mining companies in salaries and wages, and 14·9 per cent. to coloured employees, while a further 28·3 per cent. goes in necessary stores, a total of 64 per cent., or over twenty-three millions. The amount actually going in dividends to those who have put up the money for the development of the mining industry amounted to £8,205,200 or 22·9 per cent. of the total output. It is generally admitted that Johannesburg and the other townships on the Witwatersrand exist by reason of the mines, and of the distribution of money which flows from them. Besides the actual total number of employees directly supported on the mines there is the white population of the Witwatersrand numbering about 170,000 and an estimated native population of a further 50,000, only a few score of whom would have been on the Witwatersrand had it not been for the mines. It is estimated that some £12,000,000 have been invested in land and buildings on the Witwatersrand, apart from the money invested in the mining industry. In the coal industry, the capital for which has been largely put up in this country, hardly any dividends have been paid in the past, the whole of the value of the output going to working costs and being spent in wages, stores, etc., in the country." Mr. Warington Smyth's last report also contained significant references to the "shyness of capital," the inflow of which he admitted is "so necessary for development in a new country," and we may be permitted to hope that General Smuts will not further accentuate and justify that shyness by his new taxation proposals. In this connection, it is noteworthy that the total direct revenue collected in respect of the mining industry within the Union for the year 1913 was as follows; for purposes of comparison the 1912 figures are also given:

	1912.	1913.
Diamond Mines	£793,645	£1,051,317
Gold Mines	982,482	1,030,589
Base Metal Mines	42,236	38,433
Licences and Mynpacht Dues	295,093	286,050
Totals	£2,113,456	£2,406,389

Big decreases in the total may be expected under the heads of diamonds, but to what extent the other branches of mining may have to make up for the shortfall in the coming year remains a matter of conjecture. We may expect that General Smuts has not overlooked the elementary maxim of public finance that the credit of a State reflects the credit of its leading industries, and that any inequitable extra imposts on the latter are bound to react upon, and stultify any possible good effects by lowering, the former.

MINING PROGRESS OF RHODESIA.

Though the value of the total mineral output for Rhodesia has not quite realised the anticipations of those who counted on the four million mark being reached, it has, nevertheless, broken all its own records, and furnished a most creditable showing for 1914. In this issue we print full details of the December output, and the list presents many interesting features to those who follow Rhodesian mining, with its increasing volume and importance. During the year 1913 Rhodesia produced over 3 per cent. of the world's yield of the precious metal, passing in the list of the great producing countries such old-established industries as those of Canada, India, West Africa, Victoria, and New Zealand, and standing sixth in ratio of production after the Transvaal, United, States, Australia (as one State), Russia, and Mexico. In view of the diminished output of other fields, the contribution of Rhodesia is likely to rank higher for 1914 than ever. In Rhodesia to-day the mining industry is unquestionably bearing on its shoulders the bulk of the trade of the country. Any contraction of its operations must immediately be felt by the commercial and farming communities, the railways, and the B.S.A. Company, and on it the whole immediate future of the country depends. The record set up last year of a gross production of metals and minerals valued at a round three millions has been far surpassed, while in addition there have been brought to the producing stage more than half a dozen large properties which have ore reserves to the extent of five million tons—a position without precedent in the history of Charterland. Moreover, new methods have been adopted, and perfected in some cases, and competent observers on the spot tell us there is a feeling of stability which was formerly rare. The actual details of the output are as follows, *i.e.*, for the two years 1913 and 1914:—

	1913.	1914.
Gold	£2,903,268	£3,580,209
Silver	15,105	14,275
Lead	5,234	2,487
Chrome iron	141,481	107,612
Tungsten ore	427	——
Asbestos	5,224	8,612
Coal	78,421	115,099
Copper	——	50,559
Arsenic	——	161
Diamonds	7,781	3,985
Totals	£3,156,941	£3,882,999

The increased gold production of £676,941 is principally due to those new producers to which reference has been made above, viz., the Bell, which entered the producing list in March (£60,410), the Falcon in August (£50,416, apart from copper), the Cam and Motor in January (£171,602), the Eileen Alannah in the same month (£46,864), the Shamva in February (£272,871), and the Golden Kopje in September (£28,274), while the Kimberley, which came into the list late in 1913, increased its output from £30,000 to £75,000, and the Antelope similarly from £4,600 to £94,300. The decreases that may be expected in the future will doubtless be more than counterbalanced by the yields of the new producers. Nor must the part, large and important in the aggregate, played by the small producers be overlooked. Our monthly output lists provide standing testimony to the performances and possibilities of this section of the industry.

PUBLICITY AND THE ENGINEER.

The movement to stimulate interest in the engineering societies is by no means confined to this country, and both in England and America efforts have lately been concentrated in that direction. Before the Canadian Society of Engineers recently, Professor H. E. T. Haultain read a paper on the need for more publicity being sought and obtained by engineers, in justice to themselves and their work. Many of the points made by Prof. Haultain apply to engineers in this country with peculiar force, and we may, without attempting to give a *precis* of his whole paper, at least indicate a few of his more noteworthy remarks. "Safety and success," he says, "are the prime essentials for much of the work of the engineer, with the result that where he cannot see clearly, he is the more timid. He avoids doubtful material; where he cannot avoid he raises his factor of safety. He will rarely talk of his mistakes, though they may be of much greater educational value than his successes. In fact, he will rarely talk in public about his work except in the form of plans and specifications. One reason, without doubt, is that our work is intensely interesting, and we are so busy with it that we have neither the time nor the energy to pay attention to anything but our work. Probably another reason lies in the fact that we are so accustomed to putting our ideas in the form of plans and specifications that not only do we find other language difficult, but we avoid expressing ourselves on any subject that has not formed itself in our minds clearly and distinctly. An elaboration of details which the engineer's mind demands, only befogs the public or robs them of their interest. Broad impressions, sometimes purposely distorted to what the engineer would consider inaccuracy, attract and educate the public. . . . . The struggle with Nature to-day is more universal, more rapid, more intense, and more successful than ever before. The man in the forefront of the struggle, he who is forcing Nature to the use and convenience of man as never before, is the engineer, and the reason that he progresses more rapidly and more successfully than ever before is largely on account of his new weapons, but still more on account of himself and his methods. His weapons are drawn from the sciences, but the wielding is his own. The choosing of the weapon and the plan of campaign are his. But he is in the thick of the fight, and there are no war correspondents. He makes no effort to hold communication with non-combatants. He is busy for results, and to him nothing but results counts. He has not yet arrived at the stage of holding communication with the public through means of show and parade. No slave toiling at the wood pile ever shrank from the public gaze more carefully than does many an engineer from publicity. He is content to stand behind his wood pile, and the public, thinking that the pile arrived by a simple process of hewing, give as little attention to the man as to the slave. Nobody tells the public that to produce the modern pile there has been a struggle calling upon higher standards than ever before in the struggle with Nature, that the men who are winning in this struggle are men of as high a calibre in mental effort and moral fibre as in any other branch of human affairs, and very much higher than in most other callings." He concludes:—

> "Publicity of some kind we need more than anything else; but it must be of the right kind and apparently the right kind has still to be discovered. We must recognise that there are innumerable kinds of useful publicity and that many, very many, most extraordinary ones are really good form. There are many avenues closed to us, however. The engineer is too direct to be a successful politician. We study our men, but not our fellow man. The settlement of labour troubles comes more and more to the engineer, but we shall not succeed in persuading our fellow man to elect us to office for a long time to come. The study of our fellow man may be the first step to a successful publicity. Many of you, especially those who have made your mark and your assured income may say that the last thing you want is publicity. But surely you will agree that the proper kind of publicity, the kind that will educate the public to a better appreciation of the engineer would be of great help and benefit to those coming in at the gate of the profession. The fact that ordinary methods of publicity offend us is no reason why we should avoid all publicity. The problem that is before us is to find suitable publicity."

These are brave words, and represent a really thoughtful contribution to a subject upon which there has lately been some searching of hearts on the Rand.

PROGRESS OF THE SOUTH AFRICAN COAL INDUSTRY.

Capetown Bunkering Statistics—Output from Natal Collieries in 1914.

The following statement shows the total quantity of Natal and Transvaal bunker coal supplied at Capetown, including that supplied by the Union Government to their chartered steamers:—Total quantity of bunkers supplied at Capetown during the year ended December 31, 1914, 224,940 tons. Total quantity of Transvaal coal supplied at Capetown during the same period, 77,332 tons. Transvaal coal supplied by Government, 11,243 tons; representing 14·53 per cent. Total quantity of Natal Coal supplied at Capetown during the same period, 126,983 tons. Natal coal supplied by the Government, 3,227 tons; representing 2·54 per cent. Percentage of Transvaal coal supplied by the Government on the total bunkers supplied for the year, 4·97 per cent. Percentage of Natal coal supplied by the Government on the total bunkers supplied for the year, 1·42 per cent. Total quantity of bunker coal supplied by the Union Government, 14,470 tons. Percentage of Transvaal coal supplied by the Government from above quantity, 77·70 per cent. Percentage of Natal coal supplied by the Government from above quantity, 22·30 per cent. (11 per cent. of which was supplied to one steamer—Armadale Castle). Total quantity of bunkers supplied during the year, 1,014,261 tons 9 cwt. Total quantity of cargo supplied during the year, 355,547 tons 1 cwt. Bunkers supplied in 1913, 1,080,208 tons. Cargo supplied in 1913, 615,550 tons.

NATAL COLLIERIES—COMPARATIVE STATEMENT OF YEARLY OUTPUTS.

Colliery.	1914.	1913.	1912.
Dundee Coal Co. ...	379,371	389,556	259,962
Natal Navigation ...	318,243	312,387	301,447
Hlobane	251,844	245,173	224,947
D. Navigation	222,666	238,061	242,866
Utrecht	182,880	255,156	181,808
Glencoe	168,880	191,365	192,934
Elandslaagte	148,261	200,215	213,079
Cambrian	139,218	156,629	155,952
Hatting Spruit	114,463	105,600	87,686
South African	108,016	117,964	126,637
Newcastle	60,215	83,474	72,395
Natal Steam	51,255	56,935	61,779
St. George's	—	—	179.054
Ramsay	50.474	63,520	69,214
Ballengeich	41,096	125,020	91,014
Fairleigh	32,643	12,993	—
Wallsend	24.428	33,521	—
Dewar's Anthracite ...	8,912	6,731	5,091
S.A. (V'd) Coke ...	5,824	7,568	—
Avon	3,997	3,626	1,384
Ammonium	1,165	—	—
Star	—	2,190	4,268
Other small collieries..	—	724	574
Totals	2,316,665	2,608,408	2,472,085

Colliery.	1911.	1910.	1909.
Dundee Coal Co. ...	239,184	231,936	148,210
Natal Navigation ...	347,426	333,625	300,797
Hlobane	214,669	119,470	64,373
D. Navigation	274,171	276,878	164,198
Utrecht	147,857	15,921	—
Glencoe	176,782	179,646	132,333
Elandslaagte	203,405	231,387	194,393
Cambrian	155,097	152,719	125,937
Hatting Spruit	93,044	90,400	40,908
South African	118,553	142,685	144,944
Newcastle	64,908	78,858	77,005
Natal Steam	56,220	72,325	61,624
St. George's	171,061	182,982	145,860
Ramsay	57.264	66,891	42,020
Ballengeich	44,773	34,538	13,381
Dewar's Anthracite ...	3,998	2,475	—
W. Lennoxton	1,698	20,343	22,031
Talana	20,079	62,182	97,999
Zululand	3,386	—	1,683
Central	—	—	6,114
Other small collieries..	742	1,516	2,800
Totals	2,394,338	2,296,687	1,786,610

Increase in 1909 over 1908	116,867	tons.
Increase in 1910 over 1909	510,077	tons.
Increase in 1911 over 1910	97,551	tons.
Increase in 1912 over 1911	77,847	tons.
Increase in 1913 over 1912	136,323	tons.
Decrease in 1914 against 1913 ...	291,743	tons.

It may be added that the total coal exported and bunkered at Lourenco Marques in 1914 was 559,888 tons, and not 246,031 tons, as stated in our last issue.

Why Spot Tin is Scarce.

The high cash price now obtaining in England for "spot" tin and its corollary, extreme shortage of the metal for immediate delivery, may to some extent be explained by the following taken from the Union Trade Commissioner's last London report. He is dealing with wattle bark, but the facts may also apply to tin. He writes: "The difficulty just now is the scarcity of freight, lack of sufficient lighters to bring up the bark to the riverside warehouses, and dearth of workmen to deal with cargoes. The same condition of congestion prevails on the railways. A firm desirous of forwarding a parcel of bark from London to Liverpool recently had their goods held up for nearly a fortnight, at the end of which the company returned the consignment saying they were unable to deal with the goods. It can therefore be well imagined that the lot of the merchant on this side at the present time is not altogether an easy one."

Legal Decisions Affecting Mining.

SPES BONA TRIBUTE PROFITS.

In the Rand Division of the Supreme Court this week, Mr. Justice Gregorowski granted an order of attachment in favour of Robert Pender Whitelaw against David Tom Hall and interdicting the payment of moneys to respondent by the Spes Bona Tribute pending action to be instituted by the applicant against Hall for the recovery of moneys alleged to be due. The rule was made returnable on the 22nd of April. Applicant, for whom Mr. Richard Feetham appeared, alleges an agreement with respondent for the acquisition from him of a one-half interest in the net profits which Hall might receive out of the Spes Bona Tribute, a syndicate, in which he held an interest, formed for the purpose of working certain gold producing claims on tribute. Breach of this agreement by the respondent, who is now in Scotland, was alleged, and action is being brought by applicant. The order of attachment was directed against any sum belonging to respondent which may be standing to the credit of the respondent at the Standard Bank, Johannesburg, or which may be in the hands of the Spes Bona Tribute Syndicate.

Sakalava Madagascar Proprietary Oil Fields.

The secretary writes: "We have this day received the following cable from the company's engineer, Mr. S. A. R. Skertchly, M.Inst.M.M., M.I.M.E., viz.:—Number three well 927 feet deep in bituminous sandstone."

REVIEW OF THE TIN AND COPPER MARKET.

Expectations of Resumption of Business on a Larger Scale—Fluctuations of Last Year Explained—Tin Market Sensitive to Increased Demand.

REVIEWING the past year in the Metal Market, Messrs. Robert Katz & Co. say:—

Copper. After the outbreak of war, August 4, the Metal Exchange remained closed, and current engagements were carried forward until November 5, when a general settlement took place. On November 9 the Exchange was reopened for private business, and since November 16 public dealings have been proceeding in the usual manner, but only one session is held per day. American producers have suspended their statistics since the June statement. During the earlier part of the year large purchases were made by consumers in the hope of an industrial revival once the long-delayed freight rate question of the American railroads was decided. An initial decline in standard to £62 10s. cash, £62 15s. three months was consequently recovered and £65 15s. and £67 2s. 6d. paid in February, but the expected improvement did not materialise, and when in July the European crisis supervened standard dropped to £56 and £57 5s. In the narrow private dealings, after the closing of the Exchange, there was an advance of £60 cash, £61 three months, on the reported restriction of output in most producing countries, the United States estimating a curtailment of nearly 50 per cent., but the market fell away when considerable engagements open for German and Austrian account came to be liquidated, and producers at the same time disposed of electro. In this way standard dropped to £49 and £49 15s. in October, refined, however, not following to the latter parity. When in November the Exchange reopened, with derelict accounts cleared, a considerable increase of business developed, carrying standard up to £58 12s. 6d. cash, £58 17s. 6d. three months in December, followed at the last by a set back to £56 12s. 6d. and £57. Producers disposed of substantial quantities at gradual advances, satisfying the demand for the time, so that electro also leaves off below the best. At the more remunerative level now attained the curtailment of output may become less stringent, and there may be also liquidation of a portion of the American stock, though producers are credited with the intention of holding large reserves in anticipation of a boom after the war. The immediate outlook therefore appears somewhat indifferent, but in the more distant future, once peace restored, a strong industrial revival may find mines unable to cope with the demand, with the result of a big advance in prices, and for this contingency considerable buying has evidently taken place.

Tin. Anticipations of an industrial revival encouraged the Continental groups chiefly interested to give strong support, evidently in hope of reaching a price approximating the highest level of 1913 (£232), and in this way we attained £188 5s. cash, £189 10s. three months in February. But the continued slackness of trade and full supplies, especially from Bolivia and Nigeria, proved too much, and with stocks increasing there was a gradual decline to £132 and £135 at the end of July. In this metal, also, the first effect of the war was a sharp advance, cash going to £141 and three months to £143 10s., considerable quantities being immobilised in transit and through sales to Continental buyers, but when the foreign engagements came to be liquidated the market fell to £120 and £122 accepted in October. After that, with supplies hampered by transport difficulties, the suspension of sales by the Dutch Government and the withholding of shipments from Bolivia, the price was carried up again by an exceptionally big demand for various purposes, standard touching £150 cash and forward "Straits" fetching up to £10 per ton premium. Finally larger arrivals and advices of full Straits shipments have brought a reaction, though warrants continue scarce. Consumption for tinplate purposes has been poor in Wales, but rather more than the average in America. The following figures are given by the *American Metal Market:* United States tinplate production—1913, 823.719; 1914 (estimated), 900,000; 1915 (forecast), 1,000,000 tons. According to all appearances increased requirements are caused by the war, and, in addition, there are prospects of industrial revival in America. We are approaching the busy United States consuming season with small reserves, which may, however, be temporarily relieved by bigger supplies. In Holland about 4,100 tons Banca appear to be stored, owing to the last two auctions having been omitted. As for some time past no shipments of Banca have been made from the East, some of the accumulation there may come upon our market. No Billiton sales have been held since July. From Bolivia some shipments recently kept back are shortly due, but mining there is said to be greatly reduced. Altogether the market is sensitive to any increase in demand such as might come from American buying, but, on the other hand, while the price is very moderate compared with former years, larger supplies may have to be dealt with for a time.

POSITION OF THE HAENERTSBURG GOLD AND COPPER CO.

Operations Restarted—An Output for January.

FROM the first annual report of this company formerly known as the Woodbush—we learn that work was commenced upon the company's property at the beginning of December, 1913, by de-watering the mine and a manager was appointed during the month and placed under the supervision of Mr. J. R. Williams, Consulting Engineer. The manager resigned in April and was succeeded by Mr. T. C. Carter on 1st May, and he is still in charge. After the mine was de-watered the whole was put into thorough order, gradients were improved, timbering renewed and serious development work undertaken. The results of this development has been consistently good, and after a visit to the mine in September, Mr. J. R. Williams reported under date 1st October that there was available for immediate stoping, a considerable tonnage of ore which would give a minimum return on the plates of 6 dwts., and that on this basis by crushing 750 tons per month a profit might be expected of about £400 per month, and he strongly recommended the starting up of the battery. It may here be mentioned that a hitherto unknown reef, which has been styled the Middle Reef, has been discovered running parallel to the Iron Crown Reef and almost contiguous to it, giving good values and likely to enhance the value of the property of the company. As the Chairman was away at the time, it was decided to allow the matter to stand over until his return in November, when the whole question was very fully gone into, and it was decided that before taking the responsibility of starting up the mill the company should be in a position to command some comparatively small extra capital and that the non-technical members of the Board should satisfy themselves on the spot as to the prospects of the mine. Consequent on this Mr. James agreed to underwrite 500 shares, and Colonel E. O. Hutchinson and Mr. Herbert Moss visited and inspected the mine early in December in the company of Mr. J. R. Williams and the manager, Mr. Carter. Several samples were cut by Mr. Carter in the presence of the directors across the reefs from which it is proposed to draw rock immediately, assays of which gave a payable average over a stoping width of 27 inches—the almost vertical lie of the reefs permitting of easy stoping in this area. The result of this visit of the Board brought about the decision to at once prepare for milling, and it is hoped that at the coming meeting shareholders may have definite information on this subject laid before them with initial results. The chairman and consulting engineer spent the latter half of December at the mine making final preparations for the running of the plant and Mr. B. V. Blunden has been appointed battery manager. In addition to the actual development work which has been done, a new adit has been commenced at the lowest point possible. This has been carried in for a distance of about 225 feet, and it is anticipated that it will cut all the reefs in the hill at about another 200 feet. The completion of this adit will mean a considerable amount of "backs" and low working costs. The details of the initial output, that for January, will be duly announced.

Congress of Chambers of the Empire.

The British Imperial Council of Commerce notifies that the Ninth Congress of Chambers of Commerce of the Empire will take place at Toronto during the week commencing the 20th of September, 1915, and invites the Johannesburg Chamber of Commerce to appoint delegates and to submit subjects for discussion.

"Safety First" Notes.

MORE "SAFETY FIRST" LESSONS FOR THE RAND.—IV.

Details of the Safety Movement in the Lake Superior Iron Region.

[BY EDWIN HIGGINS, PITTSBURG, PA.]*

COST OF SAFETY WORK.

It has been impossible to arrive at even an approximate estimate of the amount of money spent on safety work in the Lake Superior district. Inquiries directed to all of the companies by the Bureau of Mines in 1913 were in a large majority of cases answered by the statement that no record has been kept of the money spent. Of course, many of the companies that have separate safety departments have kept records, but even some of these are incomplete in that they do not include money spent before the completion of the safety organisation. Accurate figures should be obtained in the future, however, as safety work is becoming more and more a definite part of mine operation. Perhaps an extreme case in the matter of expenditures in safety work is reported in the following statement taken from *Bureau of Mines Technical Paper No.* 30, "Mine-Accident Prevention at Lake Superior Iron Mines," by Dwight E. Woodbridge :—*Cost of Safety Devices Installed by One Lake Superior Iron Mining Company in* 1911.—Menominee range, Michigan and Wisconsin, $8,196; Gogebic range, Michigan and Wisconsin, $15,733; Marquette range, Michigan, $19,937; Vermillion range, Minnesota, $11,327; Baraboo district, Wisconsin, $222; Mesabi range, Minnesto—Hibbing district $18,770, Chisholm district $11,142, Adams district $8,001, Fayal district $8,525, Virginia district $14,815, Canisteo district $21,152; total, $137,820. Table IV., showing expenditures per year of various companies for safety work, will serve to throw some light on this subject, although the figures are extremely variable. It may be noted that the figures in this table account for only 5,480 men, whereas there were employed in the iron mines of Michigan, Minnesota, and Wisconsin, during 1912, a total of 33,275 men. From this table it appears that the lowest sum spent per year, per man employed, was $1; while the highest is more than $48. The average for the whole is $10.10 per year per man employed, which is probably a high average for the region. One company, employing over 2,000 men, spends approximately $6 per year per man employed. This company has a well-organised and efficient safety system. Another large company spends slightly more than this. In this connection it must be considered that in the beginning, when safety devices are being installed, the expense is greater than in succeeding years. It is probable that a fair average for maintaining safety work, after the preliminary work has been done, would be in the neighbourhood of $5 per year per man employed. During the year in which safety devices are installed, if an elaborate system be adopted, the cost may run as high as $10 or more per man.

TABLE IV.—*Expenditures during* 1912 *for Safety Work of some Lake Superior Iron Mining Companies.*

Annual Production, Long Tons.	Number of Men Employed Daily.	Amount Expended. $
237,358	297	5,075
225,000	265	2,000
75,000	130	1,000
350,000	110	3,000
400,000	150	3,000
250,000	310	15,000
28,100	40	230
169,708	154	885
210,068	158	480
155,000	110	903
128,465	120	4,850
312,000	85	1,000
1,250,000	1,000	1 000
2,033,242	2,178	13,715
3,700	38	311
124,000	175	1,500
102,400	160	1,407
	5,480	$55,356

DOES SAFETY WORK PAY?

Answering the question as to whether or not safety work pays, one may say without hesitation that it pays enormously from a humanitarian standpoint. There is no argument here. The records of many coal companies and other organisations which have practised safety work for a number of years show undoubtedly that it pays also from a financial standpoint. As to figures on this phase of the question in the Lake Superior district, nothing accurate is possible of compilation. Without the cost of the work as a basis, acceptable figures cannot be submitted. However, there is a method of arriving at approximate figures, based upon actual conditions in the Lake Superior region. Before going into this, it seems proper to submit some figures regarding the compensation that must be paid to miners for various classes of injuries. The States of Michigan, Minnesota, and Wisconsin all have in force a workman's compensation act. The following information is from the Public Acts of the State of Michigan, the provisions of which differ little from those of Wisconsin and Minnesota. In case of a fatal injury to an employee, the employer must pay to the dependants of the injured a weekly sum equal to one-half his average weekly wages, but not more than $10 or less than $4 a week, for a period of 300 weeks from the date of the injury. In case of permanent disability resulting from injury, the employer shall pay to the injured a weekly compensation equal to one-half his average weekly wages, but not more than $10 or less than $4; in no case shall the period covered by such compensation be greater than 500 weeks, nor shall the total amount of such compensation exceed $4,000. Thus it may be seen that a permanent injury may cost the company more than a fatal injury. For injuries resulting in temporary disability, the injured receives a weekly compensation equal to one half the difference between his average weekly wages before the injury and the average weekly wages which he is able to earn thereafter, but not more than $10 a week; and in no case shall the period covered by such compensation be greater than 300 weeks from the date of injury. The above provisions are followed by a long list of payments to be made to the injured in case of the loss of a finger, a hand, a foot, an eye, etc. In order to show what saving may be effected through the practice of safety work, let us assume an iron mine employing 1,000 men per day, in which no money is spent for safety work. Past experience has pointed out that a mine of this size, making no attempt to prevent accidents, may easily make the following yearly accident record :—Number of men killed, 6; number of men seriously injured, 40; number of men slightly injured, 250. A serious injury may be considered as one that incapacitates the workman for more than 20 days; a slight injury one that incapacitates him for less than 20 days. The toal cost in compensation for this sum of accidents, based upon the compensation stated above, may be as follows :—

6 men killed, at $2,500 each	$15,000
2 men permanently injured, at $3,000 each	6,000
13 men, average disability 20 weeks, at $7 per week ...	1,820
25 men, average disability 8 weeks, at $7 per week ...	1,400
250 men slightly injured, average disability 1 week, at $7 per week	1,750
Legal fees, hospital and other casualty expenses	15,000
Total	$40,970

This tabulation does not include payments for the loss of hands, feet, etc. In total amount it is below many records that have been noted by the writer. Now, let us suppose that this company had practised safety work, and that the death rate was three men killed per 1,000 employed (approximately the Minnesota 1912 rate) and the injuries proportionately lower. This would mean a reduction of one-half, or a saving of approximately $20,000. Of course the safety work will cost something, but even if it amounted to $10 per year per man employed, or $10,000 in this case, there would still be a balance of $10,000 saved.

CONCLUSIONS.

It has not been the intention in this paper to convey the idea that the Lake Superior iron ranges comprise the only metal-mining region in the United States where efficient safety work is done. It is acknowledged that there are individual mines elsewhere that can show accident records just as good, and possibly better than those of some of the Lake Superior mines; also that the safety movement is gaining ground throughout the various metal mining districts of the United States. The operating companies of the Lake Superior region are for the most part large and strong financially, and they can well afford to lead the way in work of this nature. In the Western metal mining States there is a much larger proportion of small operations and prospects, the owners or lessees of which cannot afford to go to great lengths in the matter of safety. It is hoped that all mine operators, from the insignificant prospector to the wealthy magnate, will eventually recognise the value of safety work. Sufficient records are now available, both from coal and metal-mining districts, to prove that safety work pays from every standpoint. In this connection, it is well to be able to say that safety work pays from a financial as well as a humanitarian standpoint, for it is a sad but true commentary that there are still some operators who cannot be appealed to except by a promise of financial gain. The writer feels that he has not done justice to the subject matter of this paper, especially that part of it dealing with the vast good that has been accomplished through the lessening of death and suffering. Again, some data concerning other phases of the subject have of necessity been omitted owing to the short time that was available in which to prepare this paper.

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* Paper read before A.I.M.E.

THE STORAGE AND HANDLING OF DYNAMITE.

Safety Directions and Advice Collected and Emphasised.

Admonitions concerning the care, manipulation and discharge of dynamite are frequently set forth in books and magazines and also in pamphlets issued by the manufacturers of explosives. Nevertheless, the repetition of such directions and advice never loses any of its value as a safeguard to the lives of miners. In *Miners' Circular* No. 19, which has just been issued by the United States Bureau of Mines, Edwin Higgins, the author, gives the important facts which one should know in connection with the prevention of accidents. The word " dynamite " as used in this circular means that class of explosives in which nitroglycerin is absorbed in or is mixed with other materials. Ordinary dynamite consists chiefly of a mixture of nitroglycerin and such materials as wood pulp, sawdust, or some mineral substance. By the use of different materials and of different methods of mixing, different kinds of dynamite are made, such as the ammonia, low-freezing gelatin and granular dynamites. Ordinary dynamite of different grades freezes at 40 to 50 degrees F., but the specially prepared low-freezing dynamites may be used in temperatures above 35 degrees F. without freezing. When heated to about 200 degrees dynamite explodes from a shock or blow. Dynamite also explodes from a shock or blow at ordinary temperatures, but the violence of the shock or blow required to explode it becomes less as the temperature increases. When dynamite is heated to 350 to 400 degrees it explodes from heat alone. When not confined, a small quantity of dynamite usually burns without exploding, but if a large quantity of it is burned, even in the open, it is likely to explode. Although dynamite when burned in air does not always become highly heated, the experiment is a dangerous one to try. Frozen dynamite is difficult to detonate with a " blasting cap," but it is very likely to be exploded by friction such as is produced by punching a hole in it with a metal skewer or by cutting it with a hatchet or axe. Dynamite (especially 40 per cent. and stronger) may lose strength if repeatedly thawed and frozen. If dynamite is exposed for a long time to a temperature of 90 degrees or higher it becomes more sensitive to shock and may lose strength. Nitroglycerin is readily taken into a man's body through the pores of the skin; it then makes the heart beat faster and usually causes headache in persons not accustomed to it. Concerning the storage of dynamite, the author says: —

> In large mines the storage of dynamite is a problem for the management; therefore the following remarks apply to small mines or prospects, where the miner himself must take entire charge of explosives. When storing dynamite on the surface, it is often best to use as a magazine an abandoned drift or other opening on a side hill near at hand; if none is available one can easily be made. Brick or stone buildings are suitable, but are not so cool in summer as an underground storage place. Avid the use of wooden structures of any kind, for they are liable to catch fire and are often used as targets by thoughtless hunters and others. In selecting a storage place remember that exposure to the heat of the summer sun may make dynamite sensitive and will in time cause it to lose its strength. Surface magazines should be well drained and the ground around them cleared of all dry bush and timber. They should be provided with a lock and key and should have an easily seen signboard showing that dynamite is stored there. If no suitable place can be provided on the surface small quantities of dynamite may be stored underground, in a remote or separate part of the mine where an explosion will be least likely to endanger men at work. Such a storage place should be dry and the door should be fastened with a lock and key. Never store large quantities of dynamite underground. Keep nothing but dynamite in the magazine. Cape, fuse, matches, candles or refuse of any kind in the magazine are sources of danger. Caps and fuse should be kept in a separate place at least 50 feet away from the dynamite. Dynamite boxes should be laid flat, right side up, and so stored that the old stock will be used first. If different grades are in use, keep them separate. If the magazine is warm, the dynamite boxes should be turned over, say, every two weeks, to prevent the nitroglycerin from settling in the ends or sides of the cartridges. Do not smoke nor carry lighted lanterns, candles, carbine lamps or torches in the magazine. If possible the key to the magazine should be instrusted to only one man.

Under the heading of the handling of explosives, Mr. Higgins says:—

> " Blasting caps " (detonators) are charged with fulminate of mercury, which is one of the quickest and most powerful explosives. It it poisonous and very liable to explode from heat, shock or friction. The explosion of an ordinary " cap " will tear a hole in a board about an inch thick, or it will blow off a man's jaw, or tear his hand to pieces. Never open a box of " caps " or remove the " caps " with a wire or nail. " Caps " should not be scraped with any kind of metal or examined near an open flame. They should not be carried loose in the pocket, nor left lying where they may be stepped on. In making the " cap " fast to the fuse use an approved cap crimper. Never use the teeth for this purpose. In handling fuse do not bend it any more than is necessary. Twisting or bending fuse is liable to damage it and may result in a delayed blast. The fuse should always be cut long enough to allow the man firing the blast to get to a safe place. It is dangerous to attempt to hasten an explosion by using a short fuse. At many mines the dynamite is sent underground in the original box with the cover off. This practice is dangerous because someone may happen to stand over the open box with a lighted torch or candle in his hand or hat. Where dynamite is sent down in the original box with the cover on, the cover should be removed underground with a wooden mallet and a wedge of wood or bronze. Boxes containing dynamite should not be slid over the floor or otherwise roughly or carelessly handled. Dynamite cartridges that are not used should be returned to the magazine and placed in a box. Do not carry dynamite cartridges loose in the pocket, nor carry caps and fuse in the same place with dynamite. If the management does not supply a sack in which to carry dynamite, the miner should get one for himself. A gunnysack will serve the purpose. A common but dangerous practice is to throw a sack of dynamite down a rise instead om carrying it. Tying dynamite cartridges in a bundle by means of a fuse damages the fuse. Furthermore, when a bundle so tied is being carried from the magazine to the face a stick of dynamite may fall out of the bundle and lodge in some place where it will be later accidentally exploded.

Never use frozen dynamite. In charging holes, the cartridges and primer should be pushed in carefully and tamped with a wooden-bar—not with a drill, a crowbar or other metal tool. If a hole has been " chambered " or " sprung," give it plenty of time to cool before charging it. One man should never attempt, without assistance, to spit more than five holes. See that everyone is out of the danger zone before firing.

Betsiriry Oil Fields.

The following cable has been received from Dr. J. McClelland Henderson, who is in charge of the operations of the Betsiriry Oil Fields in Madagascar: " Drilling started January 2nd, total footage drilled 217 feet, including 132 foot waterwell, four feet away, section to 35 feet sandy to clay, to 60 feet oilsand with black viscuous oil, to 132 feet blue sandstone. Stopped for repairs, Henderson." The directors have reason to believe the stoppage is only temporary.

Transvaal Tin Mining in Picture.

The Mill and Dressing Plant, Zaaiplaats Tin Mine.

ECONOMIC GEOLOGY OF THE BELGIAN CONGO.—IV.

[BY SYDNEY H. BALL AND MILLARD K. SHALER.]*

COPPER.—*Continued.*

Atherton reports pyrite at Kabolola, and believes copper glance to be present at Kambove. Studt mentions likewise the presence of chalcocite and also of bornite and covellite. The unimportance of sulphides is rather remarkable, in view of the fact that water level at the Star of the Congo mine is at a depth of about 50 feet, and at Kambove presumably at about the same depth. Cobalt is present as an oxide, probably carrying manganese, according to Guillemain, also presumably as a phosphate of copper and cobalt. Calcite, quartz (both crystalline and chalcedonic), dolomite, limonite, hematite, and manganese oxides (both psilomelane and braunite) are common gangues. Barite occurs also at Kambove mine No. 1, and Buttgenbach reports that there a bituminous substance is associated with copper oxide and pulverulent manganese oxide. Hematite is not only intergrown with malachite, but also forms bed like bodies in the vicinity of the copper deposits. Magnetite crystals and graphite (Atherton and Buttgenbach) are presumably to be considered as original constituents of the country rock. The ore is of good grade, and Atherton estimates that in twelve of the larger deposits there is ore carrying from 6.3 to 14.4 per cent. copper, equivalent to 1,177,960 long tons of copper. The ore is either silicious, aluminous, talcose, ferruginous or dolomitic. Of these the silicious ores are most abundant, Atherton* stating "the general average being from 51 to 63 per cent. of silica; extreme cases go to 83 per cent." Typical analyses are given in the accompanying table: Although the Star of the Congo ore carries no appreciable quantity of precious metal, in the other mines traces at least of gold and silver are usually present. The gold varies from 0 to 3 grams per ton, and silver reaches a maximum of 72 grams. Although small placers are derived from the copper deposits, Buttgenbach in panning the copper ore of the Kambove mine itself, failed to get a colour. The amount of cobalt is notable. In 1911, the crude copper from the Star of the Congo mine contained about: copper 89.90 per cent., cobalt 5.5 per cent., iron .3 per cent., and sulphur 1.1 per cent., and shipments the past summer (1913) analysed as follows: copper 89.85, cobalt 3.25, iron 1.8, and sulphur 0.8 per cent. The Katanga copper deposits are quite similar in mineral paragenesis and in form, and probably all have a common origin. Cornet believes these deposits to be the "iron hats" of copper sulphide bodies, as does Buttgenbach, who expects further than the sulphide body will consist of chalcopyrite, bornite, hematite and magnetite, in a vein or veins parallel to the bedding of the sedimentary rocks. He states that the rocks containing the copper ores were folded in Middle Carboniferous time, and that the ore deposition was of similar age. Studt believes them to be deposited by magmatic waters connected with a granitic intrusion of Mid-Devonian age. Stutzer is also strongly inclined to believe that the Star of the Congo mine is situated on the oxidised portion of a sulphide vein. Stutzer states that the Katanga ore bodies are similar to that of Bwana M'Kubwa, situated in Rhodesia, on the Belgian Congo frontier, at no very great distance from and on the strike of the Katanga belt. Certainly, from Speak's recent report the country rock is similar even to the silicified dolomite, although the amount of chalcocite present with depth is considerably greater. Speak apparently considers the Bwana M'Kubwa ore bodies to have been deposited by ascending water. Until the cellular quartzose rock, frequently associated with the deposits, was proved to be silicified dolomite, the inference that the original deposits were veins, with the country rock near by more or less impregnated with chalcopyrite or some other sulphide, was not untenable. The small quantity of sulphides found to date, notwithstanding the fact that exploration has extended to depths at which under similar climatic conditions the zone of secondary enrichment at least should have been encountered, is rather against the idea that these are veinlike bodies. The data now at hand appears sufficient to prove that these deposits are not veins. Atherton believes that the ore bodies were deposited by descending waters which derived their copper content from the decomposition of an overlying bed containing either cupriferous pyrite or chalcopyrite, he having identified remnants of this overlying formation to his own satisfaction. He states that the ore bodies decrease in copper content with depth, and believes that the richness of the various deposits is determined by the depth to which erosion has cut. In the more deeply eroded deposits the amount of copper, iron, manganese and cobalt decreases, and the relative proportion of copper silicate increases over that of malachite. Lindgren suggests that the ore bodies belong to the class of bedded copper deposits lying in sandstone and not dependent in origin upon igneous rocks. The copper deposits in the Red Beds of New Mexico are typical examples. We understand this, namely, a sedimentary origin, is also espoused by one of the more capable mining engineers who has examined the field. C. Guillemain, in a recent rather complete paper, argues along similar lines, namely, that beds of copper ore of sedimentary origin were changed by dynamic metamorphism. He, however, admits that mining has not proceeded to sufficient depths to definitely settle the question of origin. From Cornet's description, the ore, as is characteristic of many copper deposits of this general class, occurs in gray or white beds, and the intercalated reddish beds are usually barren. The presence of deposits in several rock series widely separated stratigraphically requires a re-occurrence of similar and unusual conditions of sedimentation which is, however, to our minds, not in favour of this hypothesis and the reported dependence in certain instances of the ore bodies upon secondary rather than original structures is of similar import. Our personal observations are too limited to speak authoritatively upon the origin of these deposits. They were perhaps, however, formed by ascending waters, as were the rather similar copper deposits of Atbasar, in the Kirghese Steppes, Siberia; deposition having taken place partially through cavity filling in highly fractured areas, and partially by the replacement of peculiarly favourable rocks. Whether or not these waters were meteoric and under artesian pressure, or were remotely connected with some magma, is, of course, most speculative. Igneous rocks are not absent, as, in addition to the granite of Mid-Devonian age, which occurs near some of the ore bodies in the south-eastern end of the belt, there are in the Star of the Congo mine, according to Studt, several dikes of minette or mica syenite. To the north of this belt the apparently similar copper deposit at Kapula, of which the ores and the mineralised rocks are like those of the copper ore bodies in the main belt, according to Gwyn Williams, occurs along a granite contact.

TABLE OF ANALYSES, KATANGA COPPER ORES.

	No. 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
SiO_2	55.62	58.40	67.19	74.21	34.9	33.80	46.60	8.00	28.95	57.40	43.70	47.00	55.40	74.40	61.65	66.40
Al_2O_3	2.65	5.90	5.67	3.85	16.6	10.50	12.70	——	8.60	12.28	11.69	11.43	4.40	2.46	4.64	4.32
FeO	6.75	6.60	5.81	3.79	6.50	6.50	3.70	——	25.10	4.88	2.40	3.50	2.50	2.25	2.73	4.27
MgO	3.05	6.50	2.31	2.35	13.70	14.00	14.40	20.00	2.37							
CaO	Traces	0.40	——	0.05	——	0.20	0.20	27.00	2.26							
CaO and MgO										1.95	8.95	10.82	6.06	3.18	5.90	5.74
Copper	8.	8.60	7.10	6.63	11.30	13.50	8.10	1.20	15.20	12.45	15.20	14.13	16.26	8.79	13.53	13.03
Cobalt	0.24				——	2.00										
Phosphoric acid	0.13							(CC_2) 43.40								
Loss					12.2	19.50	10.80	0.40								

Nos. 1, 2, 3, 4, Siliceous ores, Star of Congo mine.
Nos. 5, 6. Rluminous or "green" ore: green schists in hanging wall, Star of Congo mine.
No. 7. Talcose ore in hanging wall, Star of Congo mine.
No. 8. Dolomitic ore in footwall, Star of Congo mine. (Another analysis shows 1 per cent. of Al_2O_3.)
No. 9. Black ore, No. 12 of section, Star fo Congo mine.
Nos. 10 to 16. Analyses from north and south levels, Kambove mine.

(*To be continued.*)

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*Published by permission of the Societie Internationale Forestiere et Miniere du Congo in "Economic Geology."

Mr. McCormac, formerly Chief of the Public Works when in Cradock, has been appointed Engineer-in Chief in German South-West. Captain Harvey, until a few weeks ago Chief of Police at Cradock, has been appointed at the head of the Police Administration in German South West. Mr. George Brynes, we understand, has been promoted to Chief Paymaster in Pretoria, while Dr. Clark (Cradock) is head of the Medical Division in the German South West operations. Mr. M. McCormack has been appointed D.A.Q.M.G. in South-West, with the rank of captain.

ORCHARDING AND MINING IN TASMANIA.

A Rand Colony on the Tamar—Effect of War on Base Metal Mines—Interview with Mr. J. P. Johnson.

In our issue of 4th April last we gave some particulars of Mr. Johnson's Tasmanian orcharding scheme, which he was then introducing to Rand men. During his visit he succeeded in inducing several of his friends and others to take up orchard land there, with the result that there is now quite a Rand colony on the Tamar, or, rather, there will be when they go to settle on the orchards now being planted and brought up for them in their absence. Mr. Johnson is now making another visit in the same connection, and we have taken the opportunity to obtain from him such information as we think will interest our readers about this far-off ramification of Rand enterprise. Mr. Johnson, it will be remembered, was for many years connected with mining on the Rand, and is author of "The Mineral Industry of Rhodesia" and other books on South Africa, and has since settled down as an orchardist at Kelso, in the Tamar Valley, Northern Tasmania. Mr. Johnson claims that Tasmania is a little known part of the world, about which a great deal will be heard in the near future, both in connection with mining and industrial matters as well as orcharding. There are, of course, mines of world-wide importance there, such as the Mount Bischoff tin mine, the Mount Lyell copper mine, and the Zeehan silver-lead mines, while there are many minor properties scattered over the country. The war has, of course, seriously disturbed much of the market for their products, but the State has met the situation by advancing half the value of the metals produced. The Government has also undertaken a big electrical power scheme. In the mountainous interior the Great Lake feeds two of the island's largest rivers, and it is estimated that by placing turbines at the overflow sufficient power will be produced to supply all the possible industrial requirements of the whole of Tasmania at a very low cost.

Tasmania is mountainous in the interior, resembling the Highlands of Scotland, with snow (in winter) capped peaks and great lakes. The peripheral lowlands somewhat resemble the south-west of England, the climate being more genial. In the north the winters are much milder than in England, while the summers are never so hot as on the Australian mainland or in South Africa. The rivers are permanent in character, and do not dry up in the summer, and droughts are unknown. On the west coast the rainfall is excessive, while on the east coast it is barely sufficient. The great northern orcharding area, the Tamar Valley, has an average rainfall of 28 inches, well distributed throughout the year. Owing to the clay subsoil; which is present throughout the greater part of the valley, irrigation during the two dry months is unnecessary, and is not practised. The Tamar Valley is a long narrow valley extending from the sea to the city of Launceston, a distance of forty miles. It is hemmed in by rugged hills covered with virgin forest, and encloses a magnificent navigable waterway, with jetties here and there. Between the hills and the river lie the existing orchard clearings. An apple orchard becomes self-supporting in the fifth year, and in the tenth year yields an average profit of £35 per acre; this in a place where the cost of living is as cheap as in England. The possibilities of even a small acreage are immense, and profits of £150 per acre are not unknown, but there are, of course, extreme cases. The time taken by the trees to come into bearing is the one disadvantage of orcharding. To obviate this, Mr. Johnson's firm has introduced a system by which the purchaser of land may have his orchard planted and brought to bearing under the supervision of the Government expert. The purchaser is thus able to remain at his occupation, and need not take over until the orchard is in bearing. All blocks sold are inspected by the Government expert, and are accompanied by a satisfactory report from him.

Mr. Johnson recommends buying forty-five acres and planting ten, to allow for future expansion, but if the prospective orchardist cannot afford it, fifteen is sufficient, ten to be planted and the rest kept for house, etc. The price is £5 to £12 per acre uncleared, according to distance from nearest jetty, except for ground actually on the river's edge, which commands a fancy price, and of which there is little left. The cost of clearing, planting, fencing, and purchase of trees for ten acres is approximately £200. The cost of upkeep to the fifth year is about £70 per annum. These monies, of course, are only required in instalments as the work progresses. In order to keep owners fully advised as to what is going on, the firm issues monthly Progress Reports, detailing what work is being done on each block, the monthly expenditure incurred, etc. Under an arrangement with the Tasmanian Government, the Government orchard expert sends an annual report to each absentee owner, reporting on the general management of his property. Mr. Johnson says his firm is managing for over seventy absentee owners. The pioneers of this orcharding development upon the banks of the Tamar are abundantly satisfied with the results of their few years' work. The output, which is now beginning to make a sensible increase, is of the finest quality, and every consignment has realised very satisfactory prices. Already nearly all the river frontage is taken up and the banks dotted with splendid homes. Co-operative packing sheds and other facilities are being erected at intervals along the river. The settlers are of a very fine class, largely retired Anglo-Indians, but people are coming from all parts of the world. "I doubt very much whether there is any other part of the world where one can obtain apple-growing land right on a magnificent navigable waterway at the price; certainly there is none which combines in addition such delightful climatic, scenic, and social conditions."

According to a dispatch from London, the classification of copper as contraband of war is not new, but really 120 years old. The dispatch says:

> "It has been discovered here that copper, which is the most disputed point in the controversy about the British interpretation of what is and what is not contraband of war, was specifically mentioned in the Anglo-American Treaty of 1794. In Article XVIII. of that Treaty there is a list of contraband articles. Sheet copper is one of them. The copper which is now being shipped is not sheet copper, which in those days was used for shipbuilding, but is in other forms. The fact, however, that copper was then considered contraband is now regarded as bearing on the present case. England declares copper absolute contraband, although it is now being used for different purposes than was the case when the ancient Treaty was made."

The best "Reef Traveller" is the *South African Mining Journal.*

City and Suburban.

In January the City and Suburban crushed 29,500 tons, recovering 12,880 fine ozs at a profit of £22,230.

MINING INSTITUTE.

TEACHING CENTRES:—{ JOHANNESBURG AND SCHOOL OF MINES, KIMBERLEY.

Prof. YATES prepares candidates for the following Government Certificates:—

MINE MANAGER'S.
MINE OVERSEER'S.
MECHANICAL ENGINEER'S.
ELECTRICAL ENGINEER'S.
MINE SURVEYOR'S

by Class Private Tuition, and Correspondence.

SOME 1914 RESULTS:—

MANAGERS	January and May	ALL Passed.
ELEC. ENGINEERS	February	66% ,,
MECH. ENGINEERS	June (Kimberley Centre)	ALL ,,
MINE OVERSEERS		Practically ALL ,,

NEARLY 200 SUCCESSES. **St. James' Mansions, Eloff Street.**

Correspondence and Discussion.

Comments on Questions Arising in Technical Practice or Suggested by Articles in the Journal—Views, Suggestions and Experiences of Readers.

Supervision in Mines.

To the Editor, *South African Mining Journal.*

Sir,—I was interested in reading your comments on the above subject. It is a well known fact that not half work is being got out of the native on these fields, not because the native, mind you, is inferior as a labourer, for my experience proves him to be one of the best labourers in the world, but because 75 per cent. of the white men know not how to supervise the native. They make themselves too familiar in every way. If this is not so, why is it that one man can take over another man's boys, which is often the case, with 50 per cent. more work done? I would suggest that every man's costs be exhibited in the store at the close of every month, and that two bonuses be given, first for the least cost per ton broken, and second for the most stuff broken and shovelled; the cost to include everything except the native. If every mine was to act on the above suggestion, the cost would come down on the mines by from 1s. to 2s. per ton.—Yours, etc.,

MINER.

Utilization of Tin Scrap.

To the Editor, *South African Mining Journal.*

Sir,—The failure of the detinning industry in Pretoria calls attention to the fact that there is little possibility of making such an industry pay in this country. *Apropos* of this, the *Engineering and Mining Journal* of New York says:

> We do not know of any working on a large scale of a process of desoldering and detinning by melting. This used to be done by Chinamen, and is yet, around mining camps and some Western city dumps, but their scale of living permits them to do what is not feasible for Americans. However, the business is growing increasingly precarious, even for the Chinamen, because of the much smaller quantities of tin and solder on the modern machine made can, as compared with the can of even 15 years ago. Old buckets give no returns whatever, the tin does not melt off, it merely oxidizes. The ordinary can for food carries a little over 2 per cent. of tin, as this minimum is fixed by some Governments as the lowest permissible. A recent test on some gasoline cans gave only 0·27 per cent. Sn. This is exclusive of that in the soldered joints. Bright tin scrap from a can or bucket factory can be profitably used in the East for electrolytic detinning. This is done by the Goldschmidt Detinning Co., Chrome, N.J., and the Vulcan Detinning Co., of Sewaren, N.J., and Streator, Ill. We think that neither in this country nor Germany has detinning of dirty scrap, "swill cans," etc., been successful. Certainly the only present buyers of dirty scrap in the East are the sash weight makers. The tin in the melted pig makes it cold short, and it can only be used in sash weights, bed plates, and other castings where weight and little strength are required.

"INTERESTED."

South African Income Tax.

RECENT LEGISLATION PRESSES UNDULY HARD UPON ENGLISH INVESTORS.

To the Editor, *South African Mining Journal.*

Sir,—May I bring to your readers' attention the following letter, addressed to a London contemporary, which brings forward points of great importance to share and debenture holders of certain foreign companies carrying on business in South Africa:—

> The Act of the Union of South Africa of 1914, imposing an income tax, is of great interest to all shareholders and debenture holders of companies doing business there. Like all the Colonial Income Tax Acts, it will entail a double payment of income tax by English shareholders; but, in addition to this, its provisions are so remarkable and so conflicting that I cannot see how it can be enforced in its present form. If it had been what may be called "war legislation," I would not criticise it; but it was passed before the war, and must be taken to be considered legislation to be continued permanently. The object of the Act is to tax persons who make a profit or income in South Africa exceeding £1,000 a year, the tax varying from 6d. to 1s. 6d. in the £. The minimum income tax of 6d. is paid by the person who has £1,001 and the maximum of 1s. 6d. by the person who has £24,000 or upwards annual income. It is provided that companies are persons, and that foreign companies doing business in South Africa are liable on their South African profits equally with South African companies. This seems quite fair and reasonable, but the interpretation of the Act by the officials as at present reported will result in shareholders in companies doing business in South Africa, and who have incomes far below £1,000 a year, having to pay income tax, and they will pay on the highest scale of 1s. 6d. in the £, as if they were millionaires drawing incomes of £24,000 a year from South Africa. Mining companies are not affected by this Act, as they pay already, but most of the English property companies doing business in South Africa have large capitals and incomes exceeding £24,000 a year, with perhaps 1,000 shareholders each, and the officials propose to tax these companies at the maximum rate; so the unfortunate shareholders drawing incomes of perhaps £50 will be taxed as if they were millionaires, and they have no claim for repayment under the Act. It follows, therefore, that if I own privately some houses in Johannesburg which produce a profit income of £900 a year I shall receive this income in England free of South African income tax, but if I have shares in a company which owns similar houses and pays me a dividend of £900 a year, I shall, by the taxation of the company, have to pay £67 10s. income tax. Also, a small company with an income of £5,000 a year has to pay income tax at 8½d. in the £, but a large company with an income of £25,000 a year will pay at 1s. 6d. in the £. The above, I believe, fairly expresses the general effect of the Act. It must be intended by the interpreters of the Act to deal a blow to joint-stock enterprise in South Africa at any rate, on a large scale. If they are sub-divided into a number of small companies the effect will be less oppressive, but it will in future be impossible to propose any new enterprises of magnitude in South Africa under the Joint Stock Companies Acts, and difficult to continue the present ones successfully. The position of debenture-holders under the Act is so complicated that the officials, I believe, consider it unworkable so far as they are concerned. They are to be treated as individuals, and the rate of the tax (if they have to pay any) will vary with the amount of the income from South Africa of each debenture holder, which income is entirely unknown to the officials of the companies. No one questions the right of the Union to tax to any extent it thinks fit all profits made in South Africa, but it cannot alter the position or rights of debenture holders in English companies by anything it puts in any Acts which can have no force in this country. I think I have shown that the Act requires further consideration and amendment before it is attempted to be enforced.—Yours, etc.,

"SHAREHOLDER."

ANSWERS TO CORRESPONDENTS.

"Anxious."—Certainly hold on.

"Tin."—Company doing very well.

"Consolidated Oil."—The first annual report covering eighteen months to 31st March, 1914, showed that no oil capable of commercial exploitation had been struck. A profit of £6,100 in the balance sheet was subject to realisation, and preliminary and administration expenses carried in suspense in the balance sheet amounted to £8,700. The auditors, it was stated, had made a report, but the report was not printed in the balance sheet.

MINING MEN AND MATTERS.

Mr. S. C. Steil, Joint Secretary of the Rand Mines, Ltd., has returned to the Rand.

* * * *

An interesting and important paper will be read by Mr. H. Stuart Martin at the next meeting of the South African Institution of Engineers.

* * * *

Mr. J. P. Johnson, author of "The Mineral Industry of Rhodesia," formerly of the Rand and now settled as an orchardist in the Tamar Valley, Tasmania, is paying a visit to Johannesburg and is staying at the Grand National Hotel.

RHODESIAN MINERAL OUTPUT IN DETAIL.

Official Returns of Gold and Mineral Output from Southern Rhodesia for the Month of December, 1914.—Total Mineral Production for Year Valued at £3,882,999.

WE have received for publication from the office of the Rhodesia Chamber of Mines (Incorporated) the following detailed statement of the mineral output for the month of December, 1914, with comparisons and values: —

MATABELELAND.

	No. of Stamps.	Tons Treated.	Yield. ozs.	Value. £
BULAWAYO DISTRICT—				
Abercorn (W. J. Lane)	(5)	68	44·87	186
Acorn (J. Stewart)	2	20	26·41	109
Annasona (H. Matthews)	3	48	46·23	192
Antelope G.M. (Rhod.), Ltd.	2B 2P 1T	3,668	992·50	4,115
Do. (slimes)	—	3,302	958·97	3,976
Antenior (W. J. Lane)	5	387	98·55	409
Bassick (Bassick M. Synd.)	5	300	108·59	450
Blanket (Blanket Syndicate)	15	549	84·53	350
Bobs (F. W. Spencer)	1C	325	45·80	187
Bucks Reef G.M., Ltd. (J. Black)	5	320	53·90	223
Do. (sands)	—	208	26·13	108
Bushtick Mines, Ltd.	28 2T	367	297·94	1,235
Do. (sands)	—	1,443	55·15	229
Do. (slimes)		1,949	74·49	309
C. (C. and D. Syndicate)	10 1C	1,367	48·01	199
Do. (sands)		1,154	133·15	552
Do. (slimes)	—	214	49·13	204
Carry (Boomerang Synd.), sands	—	140	97·60	405
Colleen Bawn (Colleen Bawn Synd.)	6 2P	446	49·66	206
Do. (sands)	—	180	43·46	180
Do. (slimes)	—	266	77·70	322
Cottage (Cottage Syndicate)	4	100	41·39	172
Dam (W. H. Robinson)	2	83	20·08	83
Dobie (Carson Mines, Ltd.), Nov.	5	204	272·62	1,130
Donald (Watson & Jackson)	3	28	7·14	30
Durban (Durban Syndicate)	2	200	240·02	995
Eagle A. (Macdonald & Co.)	10	581	266·65	1,105
Do. (sands)	—	231	20·86	86
Elumba A. (Cooper & Bosomworth)	5	300	88·56	367
Do. (sands)	--	150	32·87	136
Emu (F. C. Bennett), November	2	10	10·55	44
Ettie (R. Smith)	3	120	79·37	329
Euphorbia (D. W. K. Syndicate)	1H	25	12·72	53
Excelsie (J. H. McDonald)	3	9	9·42	39
Farvie (H. S. Henderson)	5	663	334·24	1,386
Do. (sands)	—	407	19·27	80
Flora (E. E. Beecroft)	5	737	140·69	583
Formby (Baldwin & Nield)	3	404	131·54	545
Fred (Transvaal & Rhod. Est, Ltd.)	10	1,650	1.024·35	4,246
Do. (sands)		1,650	334·13	1,385
Geduld (D. van der Berg), pngs	—		1·64	7
Germania (A. G. Haddingham)	2	141	31·81	132
Godwin B. (Barrett & Stacey)	5	270	254·66	1,056
Do. (sands)	—	214	8·10	33
Golden Butterfly (Wheeler, Davis and Rintoul)	5 1P	503	122·19	507
Do. (concentrates)	—	15	5·83	24
Intabanenda (Intabanenda Synd.)	5	234	69·13	287
Do. (sands)	—	200	19·43	80
Jeff (Horton & Stewart), sands	-	325	67·12	278
Jem (J. McCay)	2	18	5·18	21
Jumpers (J. P. McCay)	5	500	224·18	929
Do. (sands)	--	300	40·89	169
Klondyke (Lunnon & Stiven)	3	35	44·81	186
Lonely Reef G.M. Co., Ltd.	20 3T	4,500	826·46	3,426
Do. (slimes)	—	4.500	2,375·52	9,848
Long John (Susanna Mines, Ltd.)	13	1,974	118·68	492
Do. (sands)	—	1,953	231·14	958
Mary and Alice (R. Dodman)	3	60	21·03	87
Master Cecil (Master Cecil Synd.)	3	10	8·33	35
Matabele 3 (Criterion Gold Mines, Ltd.)	10	1,018	140·23	582
Do. (sands)	—	800	22·27	92
Matabele Queen's Co., Ltd.	10	1,740	256·27	1,062
Do. (sands)	—	1,740	285·59	1,184
Do. (slimes)	—	270	39·28	163
Mulloch (J. B. Richardson)	2	30	14·99	62
Nelly (F. D. Roscoe)	3H	155	111·82	464
New Eclipse (J. R. Stewart)	5	581	167·03	692
Do. (sands)		320	44·32	184
Old Nic (Chart. & Gen. E. & F. Co., Ltd.)	15 4P	2,570	646·06	2,678
Do. (sands)	—	1,428	232·55	964
Peach A. (Peach Synd.), sands	5	262	268·48	1,113
Do. (sands)		208	37·35	155
Planet (Triggs & Huntley)	5	139	30·09	125
Do. (sands)	—	228	24·39	101
Pot Luck A. (T. Berwitz)	2	100	30·14	125
Rhodesian Queen (J. Gilpin)		—	27·50	114
Roan (Robinson & Berwitz)	2	160	29·77	125
Robin Hood (L. Granger)	5	500	75·57	313
Star (Romola Nigel G.M. Co., Ltd.)	5	247	109·86	455
Do. (sands)		115	30·45	126
St. Serf (J. Cook)	3	16	14·70	61
South City (J. F. Smith), pannings			6·63	28
Teutonic (MacDonald & Battersby)	5	250	197·09	817
Tuff Nut (King's Syndicate)	5	350	94·41	391
Umvoti (Henderson & Tostack)	2	100	31·19	129
Winifred (Exchange Syndicate)	5	291	103·24	428
Do. (sands)		130	27·14	112
Wolley Dog (P. H. Davis)	2	130	118·66	492
Bulawayo district total			14,191·82	58,830
GWELO DISTRICT—				
Ardpatrick (J. E. & F. Maleham)	3	300	199·56	828
Bedad (A. & B. Synd.), Nov.	5	300	61·94	257
Do., December		275	24·91	103
Do. (sands)		200	14·01	58
Bell Reef Dev. Co., Ltd.	2B 2T	3,026	1,691·00	7.012
Blucher (Robinson & Bennett), concentrates		7·5	12·53	53
Bonsor B323 (Cornish Syndicate)	15	852	166·05	688
Do. (sands)		700	44·15	183
Bonsor B327 (T. Roberts)	10	575	61·07	253
Camelia (S. Levin), sands	—	540	38·03	158
Cinderella (P. Burt)	1E	255	17·72	73
Cissy (G. Nicholson)	1H	205	35·70	148
Collingwood (Pini & Wearing)	5	400	59·27	246
Do. (sands)		500	35·70	148
Csardas (Wolfshall Syndicate)	10	655	581·31	2.410
Do. (sands)		430	74·55	309
Do. (slimes)	-	185	20·30	84
Dream (Dream Syndicate)	5	300	102·80	426
Do. (sands)		140	37·20	154
Eileen (M. L. Price)	5	190	30·52	127
Eileen's Luck (W. Cock)	2	36	10·63	44
Falcon Mines, Ltd.	20 2T	12,608	2,826·13	11.870
Do., copper, £10,635.				
Gaika G.M. Co., Ltd.	5 1C	3.091	1,452·91	6,102
Do. (sands)		1.476	101·82	440
Do. (slimes)		1,900	128·18	538
Glen Rosa No. 1 (D. H. Currie)	5	382	491·95	2,039
Do. (sands)	--	275	164·60	682
Globe & Phoenix G.M. Co., Ltd.	40 10P	5.837	8,143·52	35.171
Do. (sands)	—	5,467	1 129·28	4.852
Do. (slimes)	—	1,448	265·10	1.164
Do. (concentrates)	--	203	621·39	2,673
Do. (slags)	--	—	51·42	216
Gothic & Pagamesa (Mashonaland Agency, Ltd.)	15 2P	840	188·98	783
Do. (sands)		825	200·45	831
Guinea Fowl (J. T. Woods), sands		200	1·94	8
Invulnerable (T. MacDonald)	5	112	6·45	27
Do. (sands)		200	6·46	27
Judy (E. A. Begbie)	5	200	69·03	286
Little Blossom (J. Hazlehurst)	--	225	55·83	231
Moss (W. M. James)	4	782	312·60	1.296
Do. (sands)		480	21·00	87
New Dunraven G.M. Co., Ltd.	5	710	87·60	363
Do. (sands)		650	30·62	127
Pompei (Bolt & Franks)	15	450	73·30	304
Do. (sands)		300	19·18	80
Pretty Polly (Bolt & Franks), sands		420	48·92	203
Redhill Development Synd., Ltd.	1C	3.087	29·58	123
Do. (sands)	—	1,200	65·95	274
Romney (T. Pedlow)	5	150	39·11	162
Tebewke 1 (A. N. Tyrrell)	15	864	222·94	924
Do. (sands)	—	950	141·32	586
Tebekwe B 81 (A. N. Tyrrell)	—	527	127·11	527
Trepolpen (C. T. Uren)	2	30	7·86	32
Trixie (S. Levin)	10	1.685	105·82	439
Twin Nugget (H. Carter)	1C	48	4·81	20
Wanderer (Selukwe) G.M., Ltd.	4GR	11.020	1,289·94	5.347
Yankee Doodle (Bruhns & Schwarz)	10	1.437	307·81	1.276
Do. (sands)	—	952	171·52	711
Do. (from lead bullion)	--		63·13	265
Yeselo (C. G. N. Duner)	--		5·53	23
Zabonkwe (Holmes & Urquhart)	5	682	49·31	205
Pannings (M. H. Brookes)	-	—	2·47	10
Gwelo district total			22,454·40	95,084

Matabeleland total 36,646·22 ozs.

Value £153,914.

MASHONALAND.

	No. of Stamps.	Tons Treated.	Yield. ozs.	Value. £
HARTLEY DISTRICT—				
Abracadabra (P. O. S. Fry), pannings	—	—	2·46	10
Beroche (H. Moser)	5	554	127·23	527
Brilliant (Mabel's Luck Syndicate)	5 1P	1,200	428·20	1,775
Brompton (R. R. Aitken)	5	900	207·30	859
Do. (sands)	—	700	55·82	244
Cam and Motor G.M. Co., Ltd.	R'stg.Plt.	10,895	4,203·07	17.821
Chadshunt (C. H. Wheildon)	5	245	288·65	1,197
Do. (sands)	—	175	41·67	173
Cheshire Cat (Arnold & Windley)	5 1P	366	84·70	351
Do. (sands)	—	260	61·47	255
Do. (slags)	—	—	2·33	10
Concession and W. Ext. (C. E. Simpson)	5 1C 2P	1,743	368·32	1,527
Do. (sands)	—	1,026	69·88	290
Dalny (Macdonald & Sale)	1 C	766	51·08	212
Do. (sands and slimes)	—	415	123·83	513
Dalny 1 W. (Macdonald & Sale)	5	575	58·20	241
Do. (sands)	—	345	47·75	198
Eiffel Blue (Willoughby's Con. Co. Ltd.)	10	1,357	515·53	2,137
Do. (sands)	—	836	39·73	165
Eileen Alannah Mining Co., Ltd.	10 1T	2,037	457·02	1,894
Do. (sands)	—	2,313	445·79	1,848
Enney Ext. (E. G. Goodyer)	5	400	113·92	472
Do. (sands)	—	272	16·14	67
Giant Mines of Rhodesia, Ltd.	30 2T	5,088	1,239·87	5,258
Glasgow Mines, Ltd.	5	590	115·27	478
Do. (sands)	—	330	37·50	155
Glencairn (Glenrosa Mines, Ltd.)	5	831	529·28	2,194
Golden Valley (J. Mack)	10	1,214	724·98	3,005
Do. (sands)	—	665	165·57	686
Greta (G. C. Hooper)	3	36	15·15	63
Guelph (J. & M. Davidson)	3	99	39·99	166
Inez (Harrill & Smith)	10	960	281·80	1,168
Do. (sands)	—	570	98·63	409
Jackie's Luck (Mrs. Smith)	5	23	11·49	48
Kanyemba (Kanyemba Synd.)	5	480	533·99	2.214
Do. (sands)	—	505	106·33	441
Lemberg (A. D. Bentley)	5	120	31·08	129
Masterpiece (J. McAdams)	5	450	168 24	697
Midwinter (Midwinter Synd.)	4	290	30 03	124
Mudale (B. C. Munro), September	2	120	76·47	317
Natta (Newdwarf Gold, Ltd.)	2	60	12·99	54
Owl (A. Rolfe)	10	1,505	944·14	3,914
Do. (sands)	—	1,490	226·34	938
Pickstone Gold Mines, Ltd.	10 1C	2,350	210·15	871
Do. (sands and slimes)	—	1,300	103·62	430
Pomposo (J. Knott)	5	116	45·89	190
St. George (Hussey & Fraser)	2	160	96·21	399
St. Louis (L. Heard), pannings	—	—	9·47	39
Shepherd's (Phœnician (Rhod.) Co., Ltd.)	5 1T	700	163·16	676
Do. (sands)	—	850	68·79	285
Thistle-Etna G.M., Ltd.	—	2.520	525·05	2,180
Do. (sands)	—	2,099	143·15	594
Trinity (G. C. Hooper)	3	70	46·82	194
Victoria (Crown Syndicate)	4	120	23 53	97
Do. (sands)	—	150	23·43	97
Village Main (Bruce & Buchanan), November	5	200	65·74	272
Do., December	5	360	107·25	445
Washington (I. J. Minnaar)	5	500	97·59	404
Do. (sands)	—	340	27·64	115
White, J. S. (pannings)	—	—	·96	4
Hartley district total			14.957·68	62,536
LOMAGUNDI DISTRICT.—				
Alluvial (W. Kelly)	—	—	6 96	29
Do. (A. Smith)	—	—	5·60	23
Anvil (R. W. Stone)	2	241	93·22	386
Eldorado Banket G.M. Co., Ltd.	15 1C	4,095	1,557·37	6,541
Do. (sands)	—	4 805	1,107·80	4,653
Golden Kopje Proprietary Mines, Ltd.	40 3T	8,450	857·38	3,6[illegible]1
Do. (slimes)	—	8,426	1.661·39	6,978
Lone Hill (Day & Main)	—	50	7·91	33
New Celtic K	—	114	9·89	41
Lomagundi district total			5,307·52	22,285
MAZOE DISTRICT				
Botha H. (London and Rhod. M. and L. Co.)	5	1,843	56·35	234
Do. (sands)		525	68 05	282
Cheza (Goldrick & Mangan)	2	120	54·17	225
Day Dawn (Day Dawn Tribute)	2	180	55 65	236
Do. (sands)		189	58·10	241
Dora (H. Diamond)	2	16	9·86	41
Doubtful (A. J. Manson)	4	150	25 28	105
Easter (F. D. Laland)	1 D	[illegible]	39·73	165
Goth B. (R. C. H. Cooke)	2	250	102·69	425
Iron I. (Laing & Walters)	2	233	19 95	83
Jumbo G.M. Co., Ltd.	30	2.000	370·13	1,534
Do. (sands)	—	1,300	187·88	779
Do. (slimes)	—	700	68·11	282
Kimberley (Mash.) G.M. Co., Ltd.	8 2T	4,700	1,159·09	4,805
Do. (sands)	—	1,900	296·46	1,229
Do. (slimes)	—	2.800	243·04	1,007
Mike (Bishop's Syndicate)	1 D	37	28·62	118
Mt. Maria (Bluff Synd.) pannings	—	—	1·39	6
Rand (Mickey Syndicate)	2	155	62·05	257
Ravine (H. O. Coker), November	2	258	59·96	248
Rosary (R. Ricardo)	1 D	13	5·78	24
S.D.C. 3 E. (B. Byerley)	2	283	38·80	161
Shashi (Athey & Lewias)	6	22	24·61	102
Tat (Oceola G.M. Co., Ltd.)	5	538	100·78	418
Do. (sands)	—	300	28·55	118
Venus (Giles & Southey)	2	90	34·55	143
Do. (sands), part November	—	140	66·30	275
Xmas 1 N.W. (B.B. & P. Synd.)	1H	1,020	30·72	127
Do., October (F.B. & P. Synd.), clean up	—	-	20·19	84
Mazoe district total			3,316·22	13,746
SALISBURY DISTRICT.—				
Alpes (P. Zaffere)	5	520	260·10	1.078
Arcturus (L. Chiappini), sands		750	77·26	320
Ceylon (Monarch (Tati) G.M. Syndicate)	5 1P	1,014	295·98	1,219
Do. (sands)	–	1,014	410·82	1,703
Cross Your Luck	2	147	60·36	250
Do., November	—	185	56·97	236
Crown 1 S.W. (Diggers' Synd.)	2	87	37·58	156
Do. (sands)	—	60	4·17	17
Found A. (O. W. Kelly)	2	301	228·06	945
Inyague 3 (P. L. Peters)	2	125	51·72	214
Do. (sands)	–	120	12·76	53
Joking (Harrison & Drabble)	2	159	188·97	783
Louise Grand (H. S. Plant)	1H	1.001	50·21	208
Do. (sands)	—	1,001	59·32	246
Mont d'Or (A. Cohen)		350	44·38	184
Mullingar (J. H Hall)	2	254	64·39	267
Old Loyalty (Shamva Ilex G.M. Co., Ltd.)	5	432	135 23	561
Do. (sands)	—	600	54·77	227
Radnor I. (London and Rhodesian Mining and Land Co.)		1,143	678 49	2,796
Shamva Mines, Ltd.	56 8T	50,451	2,180·12	9.156
Do. (sands)	—	19,947	1.872·82	7.866
Do. (slimes)	—	30,638	2.880·52	12,099
Zidonian (J. Wilson)	1 H	55	24·54	102
Salisbury district total			9,727·56	40,686
UMTALI DISTRICT.—				
Champion (J. Buchanan)	5	740	25·88	107
Do. (sands and slimes)	—	330	159·05	659
Fairview (Branken & Markham)	5	190	94·40	391
Inca (F. Young)	3	110	18·90	78
Kent Mines, Ltd.	10	950	220·31	913
Do. (sands)	—	410	13·29	55
Do. (sands), H. M. Syndicate	—	1,160	51 61	214
Liverpool (R. G. Snodgrass)	5	612	87·80	364
Do. (sands)	—	300	99·57	413
Lucknow (Toronto Rhod. Synd.)	10	343	43·85	182
Do. (sands and slimes)		259	83·34	345
Montezuma G.M. Co., Ltd.	10	950	208·60	865
Pilgrim (J. Meikle)	5	700	91·37	379
Rezende Mines, Ltd.	55	9,000	1,359·50	5,634
Do. (sands)	—	2,457	270·62	1.146
Do. (slimes)	—	1.030	130·30	553
Do. (concentrates)		88	355·50	1,499
Umtali district total			3,293·30	13,847
VICTORIA DISTRICT.—				
Empress (S. A. Prospecting and Concession Syndicate, Ltd.)	6	1,100	245·61	1,019
Do. (sands and slimes)	—	743	116·40	[illegible]
Reinhold (R. R. Schulke)	5	150	22·27	92
Texas (G. Scott), sands		300	255·61	[illegible]
Victoria district total			[illegible]·52	2,[illegible]

Mashonaland total 37,242·60 ozs.
Value £155,755.
Total gold production 73,[illegible] ozs.
Value £[illegible],669.

SUMMARY OF PRODUCTION.

		Value
Gold, ounces	73,[illegible]2	£[illegible]
Silver, ounces	13,252·59	1,[illegible]
Copper, tons	213·70	10.673
Chrome iron, tons	6,735·21	15,[illegible]41
Asbestos, tons	60·24	1.181
Coal, tons (sales)	30,[illegible]	9.228
Lead, tons	91	15

Total value of production £346,[illegible]

GOLD OUTPUT COMPARISONS.

	Ounces.	Value.
Gold output, November 1914	74,739 94	£311,711
Gold output, December, 1914	73,888·82	309.669
Decrease	851·12	2,042
Gold output, December, 1913	60,553·97	254,687
Gold output, December, 1914	73,888·82	309.669
Increase	13,334·85	54,982
Gold output, year 1914	854,479·82	3,580,209
Gold output, year 1913	689,963·71	2,903,268
Increase	164,526·11	676 941

Grand total value of gold production to date, £28,862,173.

Other Minerals. Totals to date: Silver, 1,866,225 ounces, lead, 7,415 tons; copper, 1,370 tons; chrome iron, 327,858 tons, coal, 1,359,146 tons, tungsten ores, 129·10 tons; antimony, 13·75 tons; arsenic, 76 tons; asbestos, 1,555 tons, diamonds, 10,562·50 carats; other precious stones, [illegible] carats.

C: Chilian mill; T: Tube Mill; G.R.: Gates roll; H: Huntington mill; P: Grinding pan; Pn: Pneumatic mill; D: Dolly.

THE MONTHLY TOTALS.

The following table shows the value of the monthly and annual gold outputs of Southern Rhodesia since January, 1912, together with the value of the annual outputs of other minerals:—

	1912.	1913.	1914.
January	£214,918	£220,776	£249,031
February	209,744	208,744	259,888
March	215,102	257,797	273,237
April	221,476	241,098	295,907
May	234,408	243,452	290.063
June	226,867	240,303	306,421
July	240,514	249,302	320,670
August	239 077	250,576	316,972
September	230,573	250.429	309,398
October	230,072	247,068	337,241
November	225,957	239,036	311,711
December	218,661	254,687	309,669
Gold	2,707,369	2,903,268	3,580,208
Minerals	259,578	253,674	302,791
Total value	2,966,947	3,156,942	3,882,999

Rhodesia Chamber of Mines' Report.

The report of the Executive Committee of the Rhdoesia Chamber of Mines for the month of December, 1914, has the following:—Receipts during December amounted to £2,047 10s., including loan repaid, and payments to £82 0s. 6d. £2,000 was placed on fixed deposit. The overdraft on current account at 31st December was £139 0s. 10d., while £300 remained on fixed deposit maturing in January. The following is a summary of the returns of native labourers employed on Southern Rhodesian mines during the months of October and November, 1914:—Local, October 10,803, November 9,952; Portuguese Territory, October 6,559, November 6,508; N.W. Rhodesia, October 3,548, November 3,467; N.E. Rhodesia, October 5,837, November 5,499; Nyasaland, October 7,724, November 7,853; other sources, October 882, November 847; totals, October 35,353, November 34,126. The number employed in November shows an increase of 1,095 as compared with the same month of 1913. With reference to the action of your Committee regarding the reduction of 1s. in the price paid by the Banks for native gold, during portion of the month of November last, your Committee are advised that a refund of 1s. per ounce has now been made to producers. It has been brought to the notice of your Committee by the Secretary for Mines that accidents have resulted from the use of "cheesa sticks," which produce nitrous fumes. The Government intend to introduce the following regulation, with which your Committee are in accord, to deal with the matter: "No person engaged in mining operations shall use a lighting torch which evolves nitrous fumes in burning." Representations have been made to the Government regarding the provision of adequate and safe means of crossing rivers, many of which are impassable during the rainy season.

When communicating with advertisers kindly mention the *South African Mining Journal.*

Manicaland Gold Output for 1914.

ANDRADA ALLUVIAL DREDGER PRODUCTION VALUED AT £43,410.

The following table is officially supplied by the Acting Director of Mines for Manicaland:—

	Gold Produced.		Value.		
	Gold. Ozs.	Silver. Ozs.	Gold.	Silver.	Total.
REEF BATTERIES					
Bragança	3.705·19	1.719 92	£15.337 14 6	£171 19 0	£16.009 13 6
Central	75·31	20 28	311 14 0	1 15 5	313 9 5
Chimeze - Rhodes - Banket	20 36	6·06	84 17 3	0 10 6	85 7 9
Firenza	47·04	11·55	197 9 4	1 0 1	198 9 5
Saxonia	10·52	2·73	43 11 8	0 4 9	43 16 5
South Firenza	327 64	50 49	1,365 11 6	4 7 10	1,369 19 4
Wednesday & South Wednesday	285 88	71 08	1.193 19 7	6 4 2	1.200 3 9
Total	4,561·97	1.882·11	19,034 17 10	186 1 9	19.220 19 7
CYANIDE					
Bragança	145 74	162·57	606 19 1	16 2 2	623 1 3
Chimeze --Rhodes - Banket	37·89	9·19	158 19 9	0 15 11	159 15 8
Total	183·63	171·76	765 18 10	16 18 1	782 16 11
CONCENTRATES -					
Bragança	142·03	501·22	601 2 11	54 3 9	655 6 8
Total	142·03	501·22	601 2 11	54 3 9	655 6 8
Total reef production	4,887 63	2,555·09	20,401 19 7	257 3 7	20,659 3 2
ALLUVIAL -					
Manica Alluvial...	10,374·70	825·59	43,328 9 1	82 10 3	43,410 19 4
Mudza Alluvial	·69	—	2 17 0	—	2 17 0
Total alluvial production	10,375·39	825·59	43,331 6 1	82 10 3	43,413 16 4
Grand total	15,263 02	3,380·68	£63,733 5 8	£339 13 10	£64,072 19 6

Large-Scale Sampling.

At a recent meeting of the New York section of the Mining and Metallurgical Society of America, Mr. Sidney J. Jennings described some unusual sampling expedients found necessary by the United States Smelting, Refining and Mining Exploration Company in its work on the Ebner property, near Juneau, Alaska, which it has under option: "The ore was supposed to carry $2 in gold, from which a profit of 75c per ton was expected. An error of 25c per ton in sampling might cut 33⅓ per cent. from our profits. The question was: Were we taking specimens or samples? We were cutting channels 6 inches wide by 2 to 3 inches deep, 5 feet apart in the crosscuts; and while one might suppose that if there were enough crosscuts the law of averages would hold and errors would balance themselves, we found that successive 5 feet samples would assay from a trace to $12, or even higher, per ton; hence it seemed unwise to depend on averages, when the total number of samples would necessarily be small. We therefore took samples over a strip 2½ feet wide along the crosscuts for the full height, getting 30-ton samples for each 12 feet crosscut. These we ran through a five-stamp mill. At first 30 mesh screens were used, but finally a slotted screen equivalent to 60 mesh. The pulp from the stamp was run into a 12 inch launder and the stream was cut at periodic intervals, taking out 1¾ per cent. as a sample. This sample was amalgamated, and the tailings from the amalgamating barrel were sampled, which could be done with accuracy to within 4c per ton. Yet we were never satisfied that the gold recovered in the amalgamting barrel was the right proportion of that in the original ore. Suppose you took 32 samples of ¾ lb. each from the same ore, crushed to 40 mesh. If you crushed each sample to 100 mesh and split it the halves would vary by, say, 4c. But if you took another of the original 32 samples, the variance between it and the first might be from $1·50 upwards, showing that even with 40-mesh material individual pieces of gold would go through the quartering process and not be proportionately distributed. Our millman finally put in a Wilfley table to concentrate the original 30 tons. We concentrated out about 1½ per cent. of the original, which carried all the free gold, the pyrite, galena, etc. The tailings from this table could be sampled accurately. The concentrates were amalgamated in a barrel, the tailings from which could also be sampled. In order to ascertain the value of the original sample of 30 tons we had the following factors: Net dry weight of ore crushed, weight of concentrates recovered, total amount of gold recovered in the amalgamating barrel, assay of the tailings from the barrel, assay of the tailings from the Wilfley table, total amount of gold remaining in the sand around the dies in the battery. This plan has been working three to four months and we really have secured results that check."

THE WEEK IN THE SHAREMARKET.

The New Taxation—Completion of a Satisfactory First Month—Investment Gold Stocks Firm —Tins Maintain Advance.

A MONTH of the re-opened Stock Exchange has been satisfactorily completed, and the Committee of the local Stock Exchange are being congratulated on the success that has attended their efforts to promote the smooth running of business. Rand dividend payers continue to attract most attention, and there has been a great deal of quiet buying of those stocks by shrewd investors who realize the tempting nature of some of the bargains offering. The boomlet in Far East Rand stocks has not been maintained in view of the difficulty in arousing any Government interest in the area at a time like this. The coming new taxation, as foreshadowed in this column last week, will reduce profit this year, but if it settled that the special tax is purely temporary, little harm can be done. Moreover, the promise of a graduated scale of assessment will remove the fear that the tax may hit the low-grade mines too severely. Whether the additional indirect taxation will much affect working costs or not remains to be seen. Doubtless economies effected in other directions may somewhat offset it; and the leaders of the industry will, doubtless, take the opportunity to remind the Government of the many ways it can facilitate the efforts of mine managers in this direction. Modder Deeps and Government Areas fluctuated a little during the week in keeping with the alternate hopes and fears of their holders in regard to the January output declaration. Tins remain firm at a little below the highest levels reached, and their immediate future now turns on the question of permanence for the present prices of the metal. The meagre nature of the cabled information does not enable us to attempt any reliable conclusion in regard to that; but there is a danger that the recent rise is due merely to the congestion of shipping and railways and to high freights.

	Fri., 29th	Sat., 30th	Mon., 1st.	Tues., 2nd.	Wed., 3rd.	Thurs., 4th.
Adair-Ushers	0 4*	0 4*	0 4*	0 4*	0 4*	0 4*
African Farms	8 3*	8 6	8 11*	9 3*	9 3*	9 1*
Apex Mines	11 9*	12 3	12 0*	12 0*	12 0*	12 0*
Bantjes Consolidated	—	8 3*	8 3*	8 0*	—	—
Brakpan Mines	46 0*	46 0*	—	46 0*	—	47 0†
Breyten Collieries	20 0*	20 0*	20 0*	20 0*	20 0*	20 0*
Bushveld Tins	0 5*	0 5*	0 4*	0 4*	0 5*	0 4*
Cassel Coals	10 0*	—	—	—	—	—
Cinderella Consolidated	1 0*	—	—	-	—	—
City and Suburbans	40 6*	41 0*	41 9*	43 0*	42 6*	42 6*
City Deeps	56 3*	56 6*	56 6*	56 6*	56 6*	—
Cloverfield Mines	4 2*	4 2*	4 0*	4 0*	4 0*	4 1
Clydesdale Collieries	8 0*	8 0*	8 0*	8 0*	8 0*	8 0*
Consolidated Langlaagte	31 6*	31 9*	33 0†	31 9*	—	--
Consolidated Main Reefs	17 0†	16 6*	16 3*	16 6*	16 6*	16 6*
Coronation Collieries	21 0*	21 0*	21 0*	21 0*	21 0*	—
Coronation Freeholds	0 3*	0 3*	0 3*	—	—	—
Crown Mines	70 0*	72 0*	—	—	—	—
East Rand Centrals	2 0*	2 0*	2 0*	2 0*	2 0*	—
East Rand Coals	1 4*	1 4*	1 4*	1 4*	1 6†	1 4*
East Rand Proprietary	28 6†	27 6*	27 6*	27 6*	27 6*	28 0*
Eastern Gold Mines	1 1*	1 1*	1 0*	1 0*	—	1 0*
Ferreira Deeps	—	—	41 0*	42 0*	—	—
Frank Smith Diamonds	1 4*	1 4*	1 4*	1 4*	1 4*	1 4*
Geduld Proprietary	21 3	21 3	21 0*	21 3*	21 3*	21 3*
Glencairn Main Reefs	1 0*	1 0*	1 0*	1 0*	1 0*	1 0*
Glencoe Collieries	5 9*	—	5 9*	5 9*	5 9*	5 9*
Glynn's Lydenburgs	11 0†	—	—	—	—	—
Government Areas	16 9	16 9	16 9	16 6	16 3	17 6
Jupiters	3 0*	—	—	-	—	3 0*
Kaalfontein Diamonds	0 3*	.—	0 4†	0 4†	0 4†	0 4†
Klerksdorp Props.	—	2 9†	2 9†	2 9†	—	—
Knight Centrals	5 6*	5 6*	5 6*	5 6*	5 6	5 6*
Knights Deeps	24 6*	24 0*	24 0*	24 0*	—	—
Langlaagte Estates	—	—	17 0*	16 6*	16 6*	16 6*
Luipaardsvlei Estates	7 6*	7 6*	7 6*	7 6*	10 0†	7 6*
Lydenburg Farms	—	—	2 6*	2 6*	2 6*	2 6*
Main Reef Wests	—	6 6†	6 6†	6 6†	5 6*	6 6†
Middelvlei Estates	1 6*	1 6*	1 6*	1 6*	1 6*	1 6*
Modderfontein B.	85 0*	85 0*	85 0*	87 0*	88 0*	88 0*
Modderfontein Deeps	61 3	61 6	61 0*	61 0*	60 6	61 0
National Banks	—	£11½†	—	£11½†	--	—
New Era Consolidated	5 6†	5 1	--	5 6†	4 11*	4 9*
New Geduld Deeps	1 9*	1 9*	1 9*	1 9*	1 9*	1 9*
New Gochs	12 9*	12 9*	12 9*	12 9*	12 9*	12 9*

*Buyers. †Sellers

	Fri., 29th.	Sat., 30th.	Mon., 1st.	Tues., 2nd.	Wed., 3rd.	Thurs., 4th.
New Heriots	—	59 6*	59 0*	60 0*	60 0*	60 0*
New Kleinfonteins	19 3*	19 3*	19 4½	19 4½	19 6	19 3*
New Modderfonteins	255 0†	255 0†	255 0†	260 0†	257 6†	—
New Unifieds	—	18 3*	19 0†	19 0†	18 0*	18 0*
Orange Diamonds	0 9*	0 9*	0 9*	0 9*	0 9*	0 9*
Pretoria Cements	42 6*	45 0*	44 0*	44 0*	45 0	44 6*
Princess Estate	—	-	—	—	2 0*	—
Rand Klips	2 11†	1 3a	2 9*	2 9*	2 9*	2 6*
Rand Nucleus	1 5*	1 6*	1 6*	1 6*	1 6*	1 6*
Randfontein Deeps	2 10*	2 10*	2 10*	2 10*	2 10*	2 10*
Randfontein Estates	16 0	16 0†	16 6†	16 0†	15 9*	15 6*
Rooiberg Minerals	18 6*	20 6	21 6*	22 6*	22 6*	22 0*
Roodepoort Uniteds	6 0†	6 0†	—	6 0†		—
Shebas	3 0†	2 0*	2 0*	2 0*		3 0†
Simmer Deeps	1 6*	1 6*	1 6*	1 6*	1 6	1 6*
S.A. Lands	2 4*	2 4*	2 4*	2 4*	2 4*	2 4*
Springs Mines	13 0*	13 3	13 3*	13 3*	13 3*	13 0*
Sub Nigels	9 0*	—	9 0*	9 3*	9 3*	9 3*
Swaziland Tins	20 0*	-	22 6*	25 0*	22 6*	—
Transvaal Coal Trust	30 0*	30 6*	31 0	30 0*	32 0†	32 0†
Transvaal Cons. Lands		—		13 6†	—	
Transvaal G.M. Estates	32 6*	34 6	—	35 6	35 6*	35 0*
Van Ryn Deeps	45 6*	45 6*	45 3*	45 3*	45 0*	44 6*
Village Deeps	36 3†	36 0†	—	36 0†	35 0*	36 0†
West Rand Consolidated	—	4 0*	4 0†	—	—	—
Western Rand Estates	—	—	1 6†	1 6†	—	—
Witwatersrands	—	59 6*	59 6*	59 0*	59 0*	59 6*
Witwatersrand Deeps	36 6*	36 0*	36 6*	37 0†	36 9†	36 0
Wolhuters	12 0*	12 0*	12 6	12 5	12 6	12 6*
Zaaiplaats Tins	24 0	26 0	26 6	26 3*	27 0	26 6

*Buyers. †Sellers. aOdd lots.

The Quicksilver Situation.*

The quicksilver situation is at present of unusual interest because of the large use of mercury in the preparation of fulminate for explosives, the present and probable future consumption of which must have an important bearing on the market for the metal, withdrawal of available supplies, and future demands. The following notes by H. D. McCaskey, of the United States Geological Survey, are of interest at this time:—The world's production of quicksilver, in metric tons, was 4,171 tons in 1913, and has averaged 3,728 tons, or 109,584 flasks of 75lb. net each, annually for the past ten years. During 1904 and 1905, the United States led the world in production, but from 1906 to date the leading producer has been Spain, whose great cinnabar deposits of Almaden, the output of which has been controlled by the Rothschilds and marketed chiefly in London, have proved very rich. The deposits of quicksilver ore in Idria (Carniola, Austria), and at Monte Amiata (Tuscany, Italy), have, with those of the United States (chiefly California), furnished the bulk of the remainder of the world's supply. The figures given in the survey report for 1913 show that during that year Spain produced approximately 1,490 metric tons, Italy 388 tons, Austria 855 tons, the United States 688 tons, and Mexico and all others 150 tons. The production of the United States was 20,213 flasks of 75 lb. each; the imports were 2,289 flasks, and the exports 1,140 flasks, giving an approximate consumption and stocks available of 21,666 flasks, which is probably not far from the present domestic consumption. The domestic demand is mainly for making fulminate, for amalgamation of gold and silver ores, and for manufacture of electric and other appliances. It seems unlikely that domestic production will greatly increase, so that there will hardly be any surplus in the United States for export. The Austrian production of quicksilver, controlled as it is by the Government, is definitely cut off from the world's markets, and the Italian supplies must be considered uncertain. The Spanish output is mainly controlled in London, and if this remains but little metal will be free, for a time at least, for the foreign trade. Undoubtedly large quantities of available European quicksilver will be immediately utilised in the manufacture of explosive caps for fixed ammunition for both small arms and artillery. In the countries now involved in the war, present stocks are unknown, but even if extensive they must be heavily drawn upon for some time to come, and exportation is not only prohibited by some of these countries, but quicksilver is declared contraband by all of them. The demand from Mexico, Central and South America and from China and Japan must be met from the United States, if at all. But, as shown above, this country has little or no surplus over its own consumption. It is apparent that, for a time at least, demand will exceed the supply, and prices are likely to be high. At present they are about double those prevailing in the earlier part of the year, the quotations being $75 at 80, New York, against $36 at 37 per flask in June last.

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* From the *Engineering and Mining Journal*, New York

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Engineering Notes and News.

S.A.R. Tender for Steel Sleepers and Fastenings.

Tenders will be received by the Secretary to the Tender Board, South African Railway Headquarter Offices, Johannesburg, or by the High Commissioner for the Union of South Africa, 32 Victoria Street, London, S.W., not later than noon on Monday, 22nd March, 1915, for the supply and delivery of 294,000 transverse steel sleepers.

Another New Motor Spirit.

The *Government Gazette* contains the following note:—"Patent application for 'Natalite Motor Spirit.' This is to certify that Robert Wood, merchant; Archie McInnes, engineer; George Holloway, contractor; Charles Oliver Lloyd, gentleman; Joshua Martyn Mason, manager; Mark Vincent Smyth, chemist; and Victor Percival Berry, engineer, all of Durban, in the Province of Natal, did on the 19th day of September, 1914, deposit at my office in Pietermaritzburg a specification or instrument in writing under their hands particularly describing and ascertaining the nature of the said invention and in what manner the same is to be performed, and that by reason of such deopsit the said invention is protected and secured to them exclusively for the term of six months thence ensuing."

Agents' Trading Licences.

The Committee of the Johannesburg Chamber of Commerce has conferred with the Commissioner for Inland Revenue in regard to the liability of firms to take out licences as general dealers or as agents for foreign firms respectively, and as a result has obtained from the Commissioner the following ruling, viz.:—"The definition of 'general dealer,' contained in Section 2 of Transvaal Ordinance No. 23 of 1905 is held to relate to the ordinary sale or offer for sale of goods in a shop or similar place from the proprietor's stock kept there for sale. If the business carried on is within the definition, the fact that the proprietor of a foreign business is immaterial; it is also held to be immaterial whether the proprietor is resident or not in the Transvaal, or whether he carries on the business in person or acts through a local manager or employee. The definition of 'agent or representative of foreign firm' contained in the same section indicates a different class of business altogether, but further provides that where the business of general dealer is carried on the agent's licence does not apply. It would appear from the foregoing that, unless in exceptional circumstances, two licences would not be necessary for a particular business. I am sending a copy of this letter to the Receiver of Revenue, Johannesburg."

South African Purchases of Rolling Stock.

It is stated that in addition to the order for 20,000 tons of steel rails for South Africa recently placed with Messrs. Guest, Keen & Nettlefolds, Ltd., the Union Government contemplate giving out a contract for both suburban and main line coaches. These are to be built entirely of steel, whereas most of the coaches on the South African railways in the past have been made of teak.

Municipal Power Schemes.

On the recommendation of the electrical trade section of the Johannesburg Chamber of Commerce, a communication has been addressed to the Administrator, Cape Province, calling attention to the fact that in recent cases of inquiries for tenders for power schemes connected with Municipalities in the Cape Province, it has been found that the conditions imposed on contractors were so onerous that firms were unable to submit tenders. The principal reason was that the consulting engineer reserved to himself such excessive powers that if firms had tendered they would have been compelled to provide a considerable sum for possible contingencies. The Committee submitted that it is most desirable that the conditions attaching to these schemes should be such as firms can comply with for, in the cases in question, even had the firms concerned tendered their prices would of necessity have been higher than would be the case if reasonable conditions were laid down. It is evident that in the circumstances (and particularly by reason of the absence of due competition) public interests suffer. The Administrator was, therefore, asked to authorise the Government Electrical Engineer to confer with a deputation from the Chamber of Commerce in order to discuss the difficulties which have arisen.

HIGH MINING SALARIES

For those holding Certificates as Mine Managers, Mine Surveyors, Mine Captains, Mechanical and Electrical Engineers and Engine-Drivers. Private Individual Tuition and Correspondence lessons where personal tuition is impossible. Practical Mathematics and Electrotechnics.—E. J. MOYNIHAN, Consulting Engineer, 35 6, Cuthberts' Buildings, Box 2061, Johannesburg.

Trading with the Enemy.

The Committee of the Johannesburg Chamber of Commerce inquired of the Treasury as to the terms of the Royal Proclamation of the 7th ult. to which brief reference was made in the published cablegrams. In reply, the Secretary for Finance states that the substance of the Proclamation is as follows:—"Notwithstanding anything contained in paragraph 6 of the Trading with the Enemy Proclamation No. 2, transactions hereafter entered into by persons, firms or companies resident, carrying on business or being in the United Kingdom: (a) In respect of banking business with a branch situated outside the United Kingdom of an enemy person, firm or company, or (b) In respect of any description of business with a branch situated outside the United Kingdom of an enemy bank, it shall be considered as transactions with an enemy: provided that the acceptance payment or other dealing with any negotiable instrument which was drawn before the date of this Proclamation shall not, if otherwise lawful, be deemed to be a transaction hereafter entered into within the meaning of this paragraph." The Proclamation will shortly be published in the *Union Government Gazette* and consideration is now being given to the question of extending the provisions thereof to the Union. The Acting Controller of Telegraphs notified that as from the 15th of January, cablegrams in authorised editions of A.B.C., Lieber's, Scott's and Western Union Codes may be accepted for transmission to any country of the Allies or any country which is neutral.

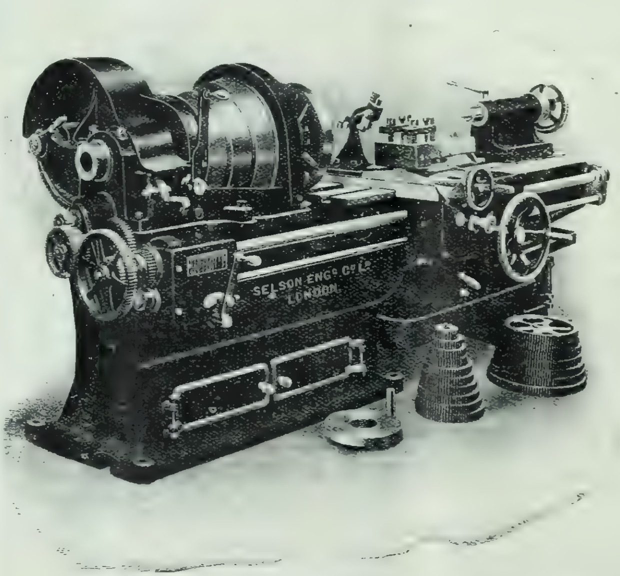
With a view to encouraging the development of new industries in the Portuguese Colonies, a decree was recently published providing that a concession for the exclusive right of manufacture in any part of the Colonies of any industrial product not already manufactured there may be granted when the public interest requires. Concessions will only be granted when the capital for the preliminary installation is not below 5,000 escudos. In the case of industries already established, exclusive rights may be granted in respect of new processes for cheapening, improving, or facilitating production. The Government may, at its discretion, permit the free importation of machinery and materials required for the establishment of the industries, as well as of raw material and other goods indispensable to the industry and not produced locally.

Water Board Chief Engineer's Visit of Inspection.

The Chief Engineer of the Rand Water Board has made a report on his recent visit of inspection to Great Britain and Egypt; copies of it have been forwarded to all members of the Board. At the February meeting of the Board a report will also be submitted, received from Mr. Blagden, Chief Engineer of the Alexandria Waterworks, on the system proposed for filtering and purifying the waters of the Vaal River, together with Mr. Ingham's remarks upon certain points raised in that report. Copies of both these documents have been circulated to all Board members. It will be remembered that, at a meeting held on the 22nd May last, the Chairman of the Works Committee and the Chief Engineer were authorised to visit Europe and Egypt for the purpose of inspecting the barrages on the Thames and Clyde, the Nile, the Rhone at Geneva, the Manchester Ship Canal and other places, and also with the object of examining the various purification and filtration plants, and the pipe, pump and engine works in those countries. Owing, as already stated, to the outbreak of war in Europe, the Chief Engineer was delayed in visiting Egypt, and was moreover obliged to return from there to England, instead of returning direct to South Africa from Alexandria as originally intended. That portion of his itinerary which included visits to certain works on the Continent had, of course, to be abandoned altogether.

New Patents.

437. George Hill Lorimer, Reuben Tellam and James West.—Improved means of and apparatus for laying dust.
438. Samuel Scott Wilson.—Improvements in means for locking nuts on bolts and the like.
439. William James Melhuish.—Improvements in the manufacture of vegetable milk and its derivatives.
440. Albert Emerson Vandercook.—Improvements in thickeners.
441. Albert Emerson Vandercook.—Improvements in process of and apparatus for treating mixtures of liquids and solids.
442. The Simmons Manufacturing Co. and William Henry Parry.—A folding chair.
443 Thomas George Deller.—Improvements in fixing the heads or stocks of brooms to their stales or handles, applicable also for other similar purposes.
444. William Holman James.—A cyanicide and method of producing the same.
445. William Holman James.—Improvements in means for purifying water.



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Electrical Notes and News.

THE PREVENTION OF ELECTRICAL ACCIDENTS IN MINES.—II.*

A Valuable Practical Contribution on a Question of Growing Importance.

[By T. J. NELSON, A.M.I.E.E.]

SWITCHGEAR.

Mining switchgear should really mean switchgear suitable for use in mines to which General Rule 124 applies. For example, the writer has seen "mining switches" fitted with overload releases, rendered inoperative by an operator inserting a piece of wood to prevent the switch cutting out when hauling more trams than he was supposed to do. Therefore switches should be designed so that no person can tamper with the overload releases unless provided with a special key. Mining switchgear may be divided into two classes: (1) Ironclad type; (2) oil-immersed type. The former type is mostly used for D.C. work, and for a fiery mine the joints should be very wide metal-to-metal and carefully machined, so that if an explosion takes place inside the switch case, the surface of the joints will sufficiently cool the flame to prevent the ignition of an explosive mixture outside. For all A.C. work the writer is of the opinion that only oil-immersed switches should be used, and the following are a few points which should receive attention in the design: (a) There should be satisfactory provisions for earthing, and should be so constructed that they can be operated with perfect safety by unskilled workmen; (b) substantial mechanical terminals should be fitted, because soldering is often prohibited in the part of the mine in which the switch must work; (c) they should be so constructed that inspection, cleaning and repairs can be carried out with safety. This is best achieved by the draw-out type of gear which enables the switch and all its working parts to be withdrawn from the live connections and, if necessary, taken away as a complete piece of apparatus; (d) all joints, tanks and castings should be made explosion-proof, *i.e.*, the mechanical strength of all parts to be made to withstand the mechanical stresses to which they are likely to be subjected in the event of an explosion occurring inside, such explosions being occasioned by the ignition of gas or breaking under heavy short-circuit conditions; (e) the oil tank should be clearly marked with the correct oil level, which should allow an ample head of oil over the switch contacts; (f) all sparking tips should be readily renewable. The success of the oil-immersed type greatly depends on the switch contacts being well covered with good-quality oil. The switches should be thoroughly examined once a week to ensure that the oil is clean and free from carbonisation, that the main and arcing contacts are in good conditions, and that the mechanical parts are in good working order. The present tendency to adopt complicated automatic features in mining switchgear is not to be recommended. It is much better to reduce the number of attachments to the lowest possible limit, and to endeavour to secure the utmost simplicity. For this reason two-coil overload trips are in general quite sufficient, except when the neutral point is earthed, when it becomes necessary to adopt three-coil trips, in order to ensure adequate protection. It is preferable to rely on an experienced electrical engineer rather than on automatic contrivances in the apparatus.

MOTORS.

Mining motors required to work in damp and dusty situations should always be ordered totally enclosed, as the maintenance cost will be lower than for open-type motors working under the same conditions. All motors for underground use should be fitted with good terminal boxes, large enough to leave ample room for making the connections. They should also be made so as to totally enclose the terminals. Accessibility should be the aim in designing rockers, brush-gear, commutators, slip-rings, etc., so that the attendant can easily get at them for cleaning purposes. The space available for installing and operating underground motors is often very limited. The bearings should be of liberal design and constructed so that no oil will creep on to the armature or rotor. The attendant should see that no oil is allowed to remain in the bottom of the frame, as it is certain to destroy the insulation. Great care should be given to the proper adjustment of the air gaps of dynamos and motors. The air gaps of induction motors are so small that they allow for very little wear of the bearings. The temperature rise of all current-conveying parts of underground motors should be kept low. All motors should be most carefully tested before being taken down the mine, preferably with twice the working pressure. It is not necessary for the writer to point out that firedamp, like other explosive gases, is only ignited on a certain high temperature being reached, and that the probability of accident in the absence of a spark or flame is comparatively small. Perfect safety in the use of electricity in mines as regards explosions can only be ensured by the use of sparkless machinery. Gases will enter every crevice, no matter how small, and the enclosed motor cannot be made absolutely gas-proof. Without holding a brief on behalf of induction motors, the writer strongly advocates them for mining operations, for not only are they free from sparking, but they are stronger mechanically, and better able to stand the rough usage to which mining machinery is particularly liable. The designers of electric motors are always striving for efficiency—and rightly so—but efficiency in a mining electrical plant should stand second to safety, simplicity and reliability. It is false economy to save a few units per day, if by doing so there is a risk of a stoppage. Each stoppage means loss of output, together with increased maintenance cost, which more than counterbalances any financial saving by a small increase in efficiency.

COAL-CUTTER MOTORS.

Coal cutter motors are put to the severest test possible as regards working conditions, and are most difficult to maintain in good order. Breakdowns frequently occur on these machines through oil and water getting at the windings. With direct current motors a source of trouble is the breaking of conductors close to the commutator, also the bursting of steel-wire bindings. In direct-current armatures there is room for improvement in connecting the conductors to the commutator. With three-phase induction motors the troubles are caused by oil, water, and the touching of rotor and stator owing to worn bearings. In the writer's experience a bar-wound slip-ring induction motor gives the best performance on a coal cutting machine. To increase safety from shock, coal-cutters and other portable apparatus should never be worked at a pressure exceeding the limits of low pressure. It is important that the trailing cable should be as flexible as possible; it should be able to withstand falls of roof, and abrasion by being pulled about the floor, and it should be so designed as to afford great protection from shock to the men handling it. The question of cost for trailing cables should be a secondary consideration. In the writer's opinion, armoured trailing cables are not to be recommended, because the armouring adds considerably to the weight of the cable more difficult to handle and therefore more liable to damage. The cable should contain a separate

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*Read before the Association of Mining Electrical Engineers (South Wales Branch).

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earthing conductor for connecting the coal cutter to the earthing system. All trailing cables should be examined daily for abrasions and other defects, and each trailing cable should be brought to the surface once a fortnight, to be thoroughly examined, tested and overhauled, and repaired on the surface by competent men; if this were always done the danger of shock and fire would be very much minimised.

UNDERGROUND LIGHTING.

For lighting underground water-tight fittings should always be used, and the lamps should be enclosed in strong well glasses, and be maintained and controlled with the same care as safety lamps. At the shaft bottom and in engine-rooms the light should be good and as free from shadows as possible, while on the travelling roads a less brilliant light is required. It is evident that the lower the voltage the greater is the safety in any class of mine. With an alternating current supply any desired voltage can be easily obtained by the use of transformers. If care is taken to earth one side on the low tension side of a single-phase transformer, the voltage to earth cannot reach a higher value than that of the secondary voltage. This increases safety from shock; or, if the voltage is transformed to, say, 50 volts, it entirely eliminates a dangerous shock. In lighting, the wires are necessarily small and easily broken, which makes the possibility of a shock very great; therefore the voltage should never be above low voltage. Underground lighting should never be carried out by placing lamps in series off a medium-pressure supply. The writer prefers to run the wires in screwed conduits, which must be carefully bonded to the cable armouring. This is far more satisfactory than the use of cleats.

SIGNALLING APPARATUS.

Although one of the earliest applications of electricity to mining, signalling is one of the last to be treated with real technical skill. The voltage of the signalling battery at Senghenydd on the day of the disaster was 9 volts. In connection with this disaster, explosion tests were carried out at the New Tredegar Rescue Station, and it was found impossible to ignite a mixture containing between 95 and 96 per cent. of methane, with sparks given off at this voltage. Ten tests were carried out, and ignition was only obtained in one of them when a voltage of 11·9 was used. The conditions in making the tests were more favourable than the conditions met with below ground. The experiments proved that the voltage in use at Senghenydd Colliery was not high enough to cause the ignition and thus account for the origin of the explosion. The tests also proved that for signalling in any part of a mine where gas may occur, the voltage should never exceed 10 volts. All bells and ringing keys should always be in explosion-proof cases. Manufacturers and inventors are now giving attention to underground signalling apparatus, and there are several types on the market which comply with the new rules. A bell-push made by Mr. G. Ellison, of Birmingham, is of a robust description. It can, in fact, be operated by striking it with a pick handle. The following hints may be useful in mines where the old method of electric signalling with bare wires can be used: (a) The connections should be as simple as possible; (b) the system should be reliable, cheap to maintain, work with the minimum amount of attention, and be easily repaired when out of order; (c) a reliable person should be in charge of all the signalling apparatus underground, because on the accuracy of signalling depends not only the output of coal, but also freedom from accidents to life and limb; (d) trouble is often caused by signal wires being too slack, and the insulators fixed too far apart. This allows the wires to come in contact with wet timber, etc. The method usually employed for fixing the wires was shown, but this method keeps the wires too close to the timbers and causes leakage. The writer always prefers the second method, and since this method has been adopted at the collieries he is connected with the signalling system has been more reliable.

EARTHING SYSTEM.

From the point of view of safety from shock and fire, the efficient earthing of any system is the most important part of an installation. It is of greater importance than the main current, for if the latter fails it means the shutting down of the machine, whereas if the former fails it may result in a fatal accident. Insulation ought to receive every care and attention, but even the best insulation is liable to fail, and when it has failed, earthing is the final safeguard. It is better to have duplicate earth connections, as the factor of safety required in connection with mining is of a much higher standard than is necessary with any other class of electrical work. The first thing to be considered to ensure the success of an earthing system is an efficient earth plate, of ample proportions, carefully installed on the surface. The best possible position for burying earth-plates is where the ground is permanently damp, and the hole should be about 7 feet deep and 6 feet wide. The plate should not be less than 4 feet square, and should be made of copper or iron. A copper strip should be revitted and soldered to the plate. The plate should be buried in a vertical position, and packed with crushed coke and old carbon ends. As the earth is filled in it should be sprinkled with salt water. It is good practice to fix a water-pipe on top of the earth-plate. The writer has three plates buried in this way, about 100 yards apart, and the resistance between No. 1 and No. 2 measured 0·9 of an ohm, while between No. 2 and No. 3 it was 0·8 of an ohm, and between No. 3 and No. 1 it was 0·9 of an ohm. The method adopted, to measure the resistance of the earth-plate was shown.

Cape Electric Tramways.

Mr. Ludwig Breitmeyer (chairman) presided at the annual meeting, held at 1, London Wall Buildings, E.C., on December 23rd. The Chairman said that the war had startled the world, and had disturbed business everywhere. It involved every state and dominion in the British Empire. Their industry could not hope to remain unaffected during this tremendous struggle, more particularly as South Africa had been called upon to play its part in the defence of the Empire by the expedition against German South-West Africa, and had, in addition, also found itself faced with local rebellion. This rebellion had now collapsed, and South Africa had escaped a very great danger. The war had, so far, not interfered with their tramway working, which up to latest advices was showing fairly satisfactory results, but there were signs ahead of some shrinkage of their revenue, and they must be prepared for possibilities in the future not now in evidence. The directors had, therefore, decided to recommend the payment of a $2\frac{1}{2}$ per cent. dividend, instead of 5 per cent., with the hope that better prospects might justify an increase later on. He might tell them frankly that, in view of the strained financial conditions prevailing throughout the world, he and his colleagues felt that it would have been perhaps more prudent and conservative to have retained their cash resources and passed the dividend altogether. They, however, had to remember also the position of the shareholders in these hard times, and after careful consideration they had decided to pay half only. The net profit of £24,618 had been made after paying all fixed obligations, including debenture redemption, and also passing £8,000 to the reserve fund. They had spent considerable sums in the purchase, reconstruction, and equipment of the Hout Bay Hotel; also a great outlay was incurred in the installation of a new unit of 500 kw. in the power station at Port Elizabeth, and additions to the rolling stock both at Capetown and Port Elizabeth. This new unit would meet all the requirements of traffic on that system for some time to come. The general manager there reported most favourably on its running and the satisfactory results he had obtained in economy of fuel consumption. In addition to this expenditure on improvements, they also had to face a steady increase in working costs, due to higher prices of coal and all other materials. Further, the imposition of the new income tax at the Cape cost them roughly £3,000 per annum, and was another burden which the company had to bear. The several schemes of improvement in the Peninsula contemplated by the Unified Municipality had been checked by the war, but a municipal loan of £200,000 was to be floated locally in Capetown to carry out sundry street and other improvements, and the tramways would, they hoped, participate to some extent in the general benefit. Notwithstanding all the unsettled conditions, the tramway operations had continued without interruption. They were working with a diminished staff, as it was the aim of the management to permit and assist every man who could be spared to take his part in the fighting line. The service was, however, well maintained.

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Commerce and Industries.

Powers of Attorney. In view of repeated representations made to the Committee of the Johannesburg Chamber of Commerce as to the effect on trading conditions of the present weakness in the law which makes no provision for the prompt registration of powers of attorney to pass bonds, the Committee addressed the Law Department on the subject, and pointed out that numerous cases have occurred of bonds being registered under such powers immediately prior to debtors becoming insolvent, and that it has transpired that some one individual creditor has obtained preference by reason of having held such power without the knowledge of other creditors, who, in consequence, have suffered heavy loss. The Minister of Justice was asked to receive a deputation on the subject, but the Committee regrets to state that a reply has been received from Mr. De Wet stating that there is no chance of legislation on the subject being considered at the coming session, as other and very important legislation, which has been prepared, has had to be shelved; and, in his opinion, an interview at present would appear to serve no purpose.

* * * *

Timber in 1914. The war affected the timber market variously last year, but, on the whole, the hardwood side suffered least. The soft woods were hurt by the restrictions placed on business with Northern Europe, but this was somewhat compensated for by the large demand that arose for Government purposes. Teak was the least hit of all the hardwoods and the maintenance of prices at a comfortable level offset any falling off in demand. Moreover, though all the chief shipments come from Burma, Siam and the Dutch East Indies, none of the regular liners carrying logs fell into the clutches of the "Emden." The volume of Australian hardwood business was good, though a little difficult after the outbreak of hostilities.

* * * *

African Banking Corporation. The meeting of the African Banking Corporation, Ltd., was held in London in mail week, at Salisbury House, E.C., the Right Hon. the Earl of Selborne, K.G. (the Chairman) presiding.

The Chairman, in moving the adoption of the report and accounts, said: If you will kindly turn to the balance sheet, I will go through the figures with you and the changes that have taken place since the last meeting. The capital, as you know, is up £200,000 by the issue of 40,000 shares, which took place in March last, and is now £600,000. The reserve remains at £210,000. Note circulation is £212,622, or £27,000 less than last year. Current accounts and deposits are £4,873,041, or £323,766 less than last year. Drafts issued are £109,169, or £75,089 less than last year. Acceptances and endorsements are £103,450, as against £325,696, but this time we have no bills rediscounted outstanding, as they had all run off. Rebate on bills is £13,119, as against £18,538 last year. Cash is £1,265,180, or about £44,006 more than in the last balance sheet. Securities are slightly more at £700,665, as against £696,487. Bills of exchange are £1,183,781, or £102,799 less.

The securities, as you will see stated in the balance sheet, are taken at the last quoted prices of the Stock Exchange of July 30. This has necessitated our meeting considerable depreciation. Bills discounted, loans, and advances are £2,718,401, or £203,068 less. Liability of customers is £103,450 to correspond with the contra side, and bank premises are £189,400, or about £27,000 more, which is accounted for by the cost of our Durban premises, which we took over during the year. The total figures are £6,160,879 10s. 5d., as against £6,612,794 14s. 8d. last year, or a contraction of £451,915 4s. 3d. The contraction in the figures can cause no surprise in view of the labour troubles in South Africa a year ago and of the war. Now, if you will look at the profit and loss account, you will find we bring in from last year £21,193 18s. 3d., as against £17,760 19s. 5d., and our profits for the year are shown as £210,297 17s. 8d., as against £229,923 7s. 9d. The charges are £150,750 13s. 11d., an increase of £3,726 15s. 10d. The increase is mainly caused by increases in salaries, which have to be made in the usual way. Rebate is £13,119 5s., as against £18,538 5s. 4d.; depreciation of furniture, £1,344 12s. 11d., and staff guarantee fund, £2,800. The interim dividend is £24,000, and the balance is £39,477 4s. 1d., as against £37,193 18s. 3d., or an increase of £2,293 5s. 10d. We do not know, nor can we possibly foretell, what the effects of the war will be upon our next year's profits, and therefore it is necessary that we should act with great caution now. It is on that account that we propose only to pay a dividend at this time at the rate of 4 per cent. per annum, making 6 per cent. for the year, which, after all, is a substantial dividend, and we carry forward all the balance of profits, £27,477 4s. 1d., which, along with the rebate, makes £40,596, to come into the new financial year.

* * * *

Cold and War. Sir Edward Holden, President of the London City and Midland Bank, in the course of an elaborate survey of the German economic position, said there was no doubt that German exports had fallen off to a much greater extent than imports, and the adverse balance would have to be paid in gold. Superhuman efforts were being made to increase the gold in the Reichsbank, now amounting to £106,000,000, but there had already been withdrawals to pay for the imports. Sir E. Holden said he believed, however, there would not be a cessation of the war owing to the gold position in Germany for twelve months, possibly longer. Austria-Hungary was unlikely to be able to continue the war for any length of time unless she received assistance from Germany. In discussing Germany's financial mobility, Sir E. Holden said time was the test. The soundness of these methods would be shown when the innumerable securities pledged for war purposes became redeemable. An enormous loss was then likely to be sustained by all indebted to the so-called war or mortgage banks, or any other of those societies which takes securities or goods in pledge. Sir E. Holden paid a tribute to Mr. Lloyd George's measures, and declared that no one could have steered them through these critical times in a more skilful manner. Events had shown the clearing banks were right in pressing before the war for an increase in currency. The situation was saved by the issue of Treasury notes, and by the patriotism of the customers of the banks and the newspapers. Ahead there might be difficult times, said Sir E. Holden, because we are still the free market in gold, which was essential to us as to Germany. He hoped people would continue to use currency notes, allowing the gold to filter into the banks, and the bankers would not hesitate to make known their gold accumulation.

Municipality of Boksburg.

NOTICE No. 4 of 1915.

FOR SALE.

Tenders are hereby invited for the purchase of one 8/10 h.p. Vertical Boiler (second-hand), with pump, injector, and all necessary fittings; tested 100 lbs. pressure 19th August, 1913, and examined and found in good order on 7th August, 1914.

On view Lake Grounds at any time by appointment.

Sealed tenders, addressed to the Town Clerk, will be received up to 12 o'clock noon on Wednesday, 10th February, 1915.

H. J. BENNITT,
Town Clerk.

Municipal Offices, Boksburg,
28th January, 1915.

Increase in Freights.

The question of "freights" is referred to in a letter to a local merchant. The communication states that freight rates as per New York line have recently advanced about 20 per cent., plus 15 per cent. surcharge, flour and wheat to Capetown, 40s.; to Port Elizabeth, 42s. 6d.; to East London, 45s.; to Durban, 47s. 6d.; and to Delagoa Bay, 52s. 6d. per weight ton, plus 15 per cent. surcharge. This is an advance on flour and wheat of about 75 per cent. over what it was twelve months ago. The same communication states that hardware, which has usually run from 30s. to 35s. to Capetown, will be 37s. 6d. to 43s. 9d., plus 15 per cent. surcharge. Barbed and other wires will probably seriously participate in the advance. On general lines, first-class rates have been 36s. 3d. to Capetown, but will now be 43s. 6d., plus 15 per cent.; second-class, which has been 31s. 3d., will now be 37s. 6d., plus 15 per cent., and third-class, which was 25s., will now be 30s., plus 15 per cent., class 4, formerly 22s. 6d., will be 27s. 6d., plus 25 per cent. The foregoing are approximate to Capetown and other ports will be relatively more. It is not expected that rates will weaken during 1915.

* * * *

The W.A.S. Show.

The annual show of the Witwatersrand Agricultural Society will be held from April 5 to 10 inclusive. In spite of certain adverse circumstances, there is much promise of it being almost on a level with the most successful of preceding shows. The total prize money offered will amount to £6,185. A feature of the livestock will be the classes provided for slaughter animals (cattle, sheep and pigs). The total prize money offered for these is £433 15s. In addition, a valuable cup is offered for competition by Messrs. Franks and Beiss, and Sir Abe Bailey has also promised a cup for the best slaughter animal in the cattle classes. The classes for sheep have been entirely revised since last year. The committee is offering in prize money no less than £1,330 £691 in excess of the amount offered last year. In the cattle classes the prize money is £1,541, being an increase of £545 over last year. The Afrikander Stud-book championships will this year be held at this Show. The usual sales of thoroughbred horses, pure-bred cattle and other stock will take place on the Showground during the last three days of the Show. In the poultry section, a number of new classes have been added, and considerable improvements have been made in the poultry shed. The Society of Motor Traders have again decided to exhibit as a body, and indications at present point to last year's magnificent exhibition being surpassed this year, notwithstanding the times. In the produce section, the maize and potato classes in particular have been revised and augmented, and championship challenge cups are being offered for maize and wheat. The prize money in this section has also been considerably increased. The applications for space for the exhibition of machinery, implements, etc., are unprecedented, and the committee has at the last moment been compelled to undertake the erection of additional shed accommodation. In home industries (women's section) the prize list has also been very carefully revised and considerably augmented. Several entirely new and most attractive classes have been provided. Thanks to the munificence of the vice-president, Mr. Jan Meyer, a handsome new tea kiosk is being erected, and will be run by the ladies of the committee.

* * * *

Tanning Materials.

The following reply to a "Country Correspondent" has been taken from this week's *Leather Trades Review*, and may not be without interest to the South African wattle growers:—"Throughout the entire world the economic supply of tanning materials has become a matter for great anxiety and concern during these war times. Smyrna valonia is one of those many tanning materials which are contraband of war, and the exportation of which has been forbidden. This stops the supply of one of the most valuable pyrogallol tanning materials, and it is correct to say that there is, speaking generally, no available supply of pyrogallol tanning which may be substituted for valonia. If unable to get valonia extract (velonitan), 'Country Tanner' might try a mixture of myrabolams and mimosa or wattle bark. Myrabolams alone would prove too soft, but provided a suitable mixture of both the foregoing materials were blended the results should be satisfactory. If a rapid tannage is required, Quebracho and chestnut extracts should be used. It is reported that there is a fair stock of Greek valonia in Liverpool, but this, of course, is not nearly as good in quality as the Smyrna variety."

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Eleven Months' Imports.

The following are from the official Customs returns of the Union:—

	Eleven months ended Nov. 30. 1914. £	1913. £
Anchors and Chain Cables	442	364
Angle, Channel and T. (cwts.)	17,516	32,016
Bar, Bolt and Rod (cwts.)	175,976	241,423
Chains for Hauling	15,191	16,799
Girders, Beams, Joists, etc. (including Framework for Iron Buildings)	60,727	67,923
Hoop (cwts.)	7,749	19,861
Pig and Ingot (cwts.)	4,063	7,219
Pipes, Piping and Fittings (cwts.)	302,842	355,426
Plate and Sheet:		
Plain (cwts.)	49,734	72,115
Galvanised, not Corrugated (cwts.)	56,800	90,651
Galvanised and Corrugated (cwts.)	251,942	378,348
Tin Plate (cwts.)	4	338
Mild or Rolled and Cast (N.O.D.) (cwts.)	30,201	30,553
Total: Iron and Steel Manufactures	973,187	1,313,036
Jewellery	132,728	144,872
Jute Goods including Hessian	48,163	34,282
Lampware	38,558	53,168
Lead:		
Bar and Sheet (cwts.)	15,920	17,260
Pipes and Piping (cwts.)	3,201	3,350
All Other (N.O.D.) (cwts.)	22,619	16,575
Leather and Leather Goods:		
Boots and Shoes (pairs)	1,033,275	1,137,686
Saddlery and Harness	40,655	63,724
Manufactures of Leather (N.O.D.)	75,408	115,747
Unmanufactured Leather (lbs.)	154,010	194,334
Total: Leather and Leather Goods	1,303,543	1,511,491
Lime (lbs.)	2,519	1,691
Linen Manufactures:		
Piece Goods	2,956	4,790
Other kinds	42,369	50,214
Machinery (except Locomotives) and parts thereof:		
Agricultural	98,052	187,491
Cranes and Elevators	33,100	54,632
Electrical	407,176	404,194
Fire Engines	10,295	17,207
Manufacturing	277,872	280,975
Mining	691,064	756,970
Presses for Hay and Wool	6,632	5,127
Printing and Bookbinding	30,530	42,203
Sawing	3,934	7,253
Water boring	19,015	33,148
Windmills	64,845	65,999
All other (N.O.D.)	667,427	715,813
Total: Machinery	2,309,993	2,571,012

Albu Group.

The following are the details of results regarding the December operations of the producing mines of the General Mining and Finance Corporation group:—

Company.	Stamps.	Tons Crushed.	Total Cost.
Aurora West	80	14,500	£13,409
Meyer and Charlton	75	14,995	13,321
New Goch	120	31,500	21,308
Roodepoort United	75	33,875	28,647
Van Ryn	140	40,520	29,020
West Rand Consolidated	100	30,000	28,714
	590	165,390	£134,422

Company.	Cost per Ton.	Total Revenue.	Profit.
Aurora West	18 5·9	£17,779	£4,370
Meyer and Charlton	17 9·2	33,467	20,143
New Goch	13 6·4	30,041	8,733
Roodepoort United	16 10·9	30,655	2,008
Van Ryn	14 3·9	50,063	21,043
West Rand Consolidated	19 1·7	34,820	6,106
		£196,825	£62,403

The decreased profit from the New Goch operations is due to a slight fall (which is regarded as temporary) in the average grade of the ore mined during the month.

Review of Base Metal Prices.

Holders of silver and base metal mining shares will find the appended compilation by Messrs. Henry R. Merton & Co. of the course of metal prices during 1913 interesting:—

	Electro Copper. £	s.	Standard Copper. £	s.	Lead. £	s.	Silver. £	Zinc. £	s.	Tin. £	s.
Opening	68	0	64	7	18	5	26 7-16	21	12	168	2
Highest	68	10	66	15	24	0	27¼	40	0	188	5
Lowest	52	10	49	0	17	10	22⅜	26	5	120	0
Closing	60	15	56	15	19	0	22 11-16	27	15	146	15
Average price for year	62	5	59	9	18	14	25 5-16	23	7	156	12

New Kleinfontein.

In the quarter ended the 31st of December the New Kleinfontein Company made a net working profit of £67,313 1s. 2d., equal to 8s. 9·589d. per ton milled. The revenue from gold (less realisation charges, etc.) was £199,682 14s. 1d., and the total working costs £132,369 12s. 11d., or 17s. 3·639d. per ton milled. Subject to the annual re-estimation the ore reserves at the end of the quarter, on a mining basis, were as follows:—Payable, 2,773,975 tons; mining width, 56·14 inches; value, 5·99 dwts. Unpayable, 1,199,043 tons; mining width, 52·35 inches; value, 2·85 dwts.

Bechuanaland Trade Report.

The annual report for the year ending October, 1914, dealing with the Bechuanaland Protectorate, has just been issued by the Government. The statement shows that during the year ended March 31st, 1914, the revenue exports of the Bechuanaland Protectorate amounted to £65,139, an increase of £3,025 over the previous year. This was much better than was anticipated, it having been feared that all the heads of revenue would show a decrease, especially "hut tax," in view of the fact that the year under review was the third consecutive season of severe drought. The revenue for the three years to March, 1914, amounted to £59,305 for 1911-12; £62,114 for 1912-13; and £65,139 for 1913-14. The Protectorate is essentially a pastoral and not an agricultural country, and, owing to the drought, the usually scanty crops of maize and millet raised by the natives for their own consumption failed. The average rainfall over the territory for the year was 13 inches and the mean maximum shade temperature was 89 deg. F., and the minimum was 52 deg. F. A certain amount of mining was carried on in the country of the Tati Concessions, Ltd., resulting in an output of 1,277 ozs. of fine gold, and 312 ozs. of silver, valued at £17,767.

INVESTORS' DIARY.

FORTHCOMING COMPANY MEETINGS

Feb. 26.—Southern Freeholds; South Deeps; East Rietfontein Syndicate.
Feb. 8.—Haenertsburg Gold and Copper.
March 15. Worcester Exploration Co.
March 26. Jupiter G.M. Co.; Simmer Deep.

Apple Growing in Tasmania.

We desire to draw attention to the fact that recently several South Africans have, after thorough investigation, invested in orcharding in Tasmania, under our absentee system. Under this system we plant and manage for absentee owners, with extended payments, under Government expert supervision until such time as it suits them to take possession in person. This provides a good investment and a future home in Tasmania, where climate, scenery and social conditions are ideal. We are now managing for over seventy absentees. Land situated on fine navigable waterway. Pamphlets, giving full particulars, forwarded on application to our Mr. J. P. Johnson (for many years on the Rand, and now settled on our Kelso Estates), who can be interviewed at the Grand National Hotel, Rissik Street, Johannesburg.—Messrs. Sadleir & Knight, Orchard Agents and Attorneys, Launceston, Tasmania.—Advt.

Eleven Months' Trade.

The trade statistics for the month of November last, just issued by the Department of Customs and Excise, would be depressing reading were it not for remembrance of the fact that conditions have improved very considerably in the interim. The readjustment of the commercial machine to suit war conditions was a process so involved that surprise is occasioned only by the fact that the change has been effected so rapidly and satisfactorily. During November the value of merchandise imported into the Union was £2,207,017, as against £3,096,314 in the corresponding month of the previous year, a falling off of £889,294, and if we include articles imported for South African Governments and specie the grand total of imports was £2,524,232, and we have a reduction of £1,006,750 from November, 1913. For the eleven months ended November 30 there was a big falling off in imports, a decrease of fully six millions, the figures being—1914, £33,680,978; 1913, £39,048,444. It is in the export figures, however, that the effect of the disturbed conditions is most apparent, but the tremendous reduction is due chiefly to the retention in South Africa of raw gold and diamonds. South African produce to the value of only £962,188 was sent out of the Union during November as compared with £5,013,037 in November, 1913. The larger figure, however, included gold to the value of £2,682,652, and diamonds worth £592,618, while no bullion went out in the period under review, and the value of diamonds exported was only £708. For the first eleven months of 1914 the exports totalled £37,342,756, as against £59,780,008 in 1913. Including imported goods re-exported the total value of the export trade for November was £1,048,028 compared with £5,153,792 in the same month of 1913, and for the period of eleven months the grand totals were £38,928,474 and £61,180,029 respectively.

Central Mining/Rand Mines Group.

NOTICE TO SHAREHOLDERS.

RAND MINES, LIMITED	.. DIVIDEND NO. 23
MODDERFONTEIN B. GOLD MINES, LIMITED	DIVIDEND NO. 5
NEW MODDERFONTEIN GOLD MINING COMPANY, LIMITED	.. DIVIDEND NO. 17
ROSE DEEP, LIMITED	.. DIVIDEND NO. 27
GELDENHUIS DEEP, LIMITED	.. DIVIDEND NO. 30
NOURSE MINES, LIMITED	.. DIVIDEND NO. 21
CITY DEEP, LIMITED	.. DIVIDEND NO. 5
VILLAGE DEEP, LIMITED	.. DIVIDEND NO. 13
FERREIRA DEEP, LIMITED (BONUS) ..	.. DIVIDEND NO. 24
ROBINSON GOLD MINING COMPANY, LTD.	.. DIVIDEND NO. 45
CROWN MINES, LIMITED	.. DIVIDEND NO. 27
BANTJES CONSOLIDATED MINES, LIMITED	.. DIVIDEND NO. 6
DURBAN ROODEPOORT DEEP, LIMITED	.. DIVIDEND NO. 10

DIVIDENDS.

With reference to the declarations of the above Dividends on 12th December last, in which it was notified that they might be payable a little later than the usual date, Notice is hereby given that Warrants in payment of the above Dividends will be posted to South African Registered Shareholders from the Head Office, Johannesburg, and to European Shareholders (except those resident in the territories of enemies) from the London Office, 1, London Wall Buildings, London, E.C., on the 22nd February, 1915.

Holders of Share Warrants are informed that they will receive payment on the 23rd February, 1915, for the Coupons in respect of the above Dividends at the London Office of the Company, or at the Credit Mobilier Francais, 30 and 32, Rue Taitbout, Paris, where permissible, as specified in each Company's official declaration of Dividend.

RAND MINES, LIMITED,
Secretaries
S. C. STEIL,
Joint Secretary

Head Office, The Corner House,
Johannesburg, 4th February, 1915.

WORCESTER EXPLORATION AND GOLD MINING CO., Ltd.

(REGISTERED IN CAPE PROVINCE, AND INCORPORATED IN TRANSVAAL, UNION OF SOUTH AFRICA.)

NOTICE TO SHAREHOLDERS.

NOTICE IS HEREBY GIVEN, in terms of Section 32 of the Trust Deed, that the Ordinary General Meeting of Shareholders will be held in the Town Hall, Worcester, C.P., on MONDAY, 15th MARCH next, at 10.30 a.m., for the purpose of receiving Directors' Report, Balance Sheet, and Profit and Loss Account to 31st December last: for the election of two Directors in place of Messrs. J. F. Oliff and Chas. B. Heatlie, who retire, but are eligible for re-election: for election of Two Auditors, and for General Business.

The nominations must be sent in writing to the Secretary on or before the 1st March next.

The Share Register will be closed from the 7th to 15th March next inclusive.

By Order,
M. S. FALCK,
Secretary.

Worcester, C.P., February, 1915.

HAENERTSBURG GOLD & COPPER,

LIMITED.

(INCORPORATED IN THE TRANSVAAL.)

NOTICE TO SHAREHOLDERS.

NOTICE IS HEREBY GIVEN that the First Ordinary General Meeting of Shareholders in the Haenertsburg Gold and Copper, Limited, will be held in the Grand National Hotel, Rissik Street, Johannesburg, on MONDAY, the 8th of FEBRUARY, 1915, at 8 p.m., for the following business:—

1. To receive the Directors' Report and Accounts for the period from the inception of the Company to 31st December, 1914.
2. To elect Directors in the place of W. Holman James, Colonel E. O. Hutchinson, and Herbert Moss, who retire in accordance with the provisions of the Articles of Association, but are eligible, and offer themselves for re-election, and to fix their remuneration for past services.
3. To appoint an Auditor in place of Mr. Robert Hemphill, who retires, but is eligible and offers himself for re-election, and to fix the remuneration for the past Audit.
4. To transact General Business.

By Order of the Board of Directors,
W. BOWNESS,
Acting Secretary.

Head Office:
11-17, Trust Buildings,
Johannesburg, 24th January, 1915.

'Phone 1801 Box 2415, Johannesburg

J. R. LAWRENCE,

No. 8, LONDON HOUSE, LOVEDAY STREET.

Agent for SOUTHWARK MANUF. CO., Ltd., London.

Makers of the "Vi-Balata" Belt, the "Amber Tan," the "D.A.P., the "Orient Belt," Raw Hide Belting, Conveyor Belting, Link Leather Belting, English Oak Tan Belting, N.M.T. Belt Laces, Raw Hide Packings, Hose, &c.

Sole Agent LONDON PHOSPHOR COPPER & BRONZE CO

THE SOUTH AFRICAN
Mining Journal,
WITH WHICH IS INCORPORATED
South African Mines, Commerce and Industries.
ESTABLISHED 1891.

VOL. XXIV., PART I.] FEBRUARY 13, 1915. [No. 1220.

HEAD OFFICE: 176-180, Stock Exchange Buildings, Fox Street (2nd Floor), Johannesburg, Union of South Africa.

Telephone **913.** P.O. Boxes **963** and **418.**

Cable and Telegraphic Address: "**MINING JOURNAL.**"

AGENTS FOR GREAT BRITAIN: Argus Printing and Publishing Co., Ltd., Byron House, 82-85, Fleet Street, London, E.C.

AMERICA: Gotham Advertising Co., 95, Liberty Street, New York.

ANNUAL SUBSCRIPTION RATES: Oversea, £2; South Africa (by post), £1 10s.; Local Delivery (Town only), £1 6s.

Copies of this journal are obtainable at all Branches and Agencies of the Central News Agency, Ltd., at all News Agents and Railway Bookstalls throughout South Africa, and at the London Agency as above.

NOTICE.—The postage of this issue of the *S.A. Mining Journal* is: South Africa, 1d. All other parts, 1½d.

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Notes and News.

Springs Mines' Future Assured. We understand that the directors of Springs Mines have succeeded in effecting arrangements under which sufficient funds for the erection of reduction works of 30,000 tons per month will be forthcoming as required. Tenders are already being called for.

* * * *

"The Earthing of the Neutral." Some candidates at the recent examination for the Mine Managers Certificate are complaining of the questions set by the examiners in mechanical and electrical engineering. The questions dealing with the famous "earthing of the neutral" seem to have evoked their criticism, some candidates declaring they should not be expected to answer them. The examiners, apparently, think differently, and we should like to have other views on the subject.

* * * *

A War Medal for Rand Miners. In the House of Commons this week it was officially stated that Lord Kitchener was considering the issue of a medal to workmen employed by the industries engaged in manufacturing engines and munitions of war. Should the proposal be carried into effect, might we suggest that Rand miners engaged in the no less honourable and essential task of augmenting the Empire's "sinews of war" be similarly recognised and rewarded?

* * * *

Natal Ammonium. The second ordinary general meeting of shareholders in Natal Ammonium, Ltd., was held in mail week at the Westminster Palace Hotel, Victoria Street, S.W. The Earl of Selborne presided, and moved the adoption of the report for the period July 11, 1913, to September 30 last. They had found, he said, that their capital would not be sufficient to carry out the full programme as originally contemplated. The directors had, therefore, decided to put up a plant capable of dealing with 200 tons of coal per day to begin with, but it would be erected so that it could easily be enlarged to deal with an increased output. They had hoped to commence production next July, but he could not now hold out any hopes of starting before the early part of next year. This delay was solely due to the outbreak of war. The report was adopted.

* * * *

South African Gold Trust. The annual report of the South African Gold Trust shows a profit for the year of £74,152, leaving, after the payment of the preference dividend, etc., £43,647, which, with £25,445 brought forward from last year, covers depreciation amounting to £68,593. The directors regret that they are unable to recommend a dividend.

* * * *

Persistence of Ore in Depth. In our next issue we shall print a further contribution by Mr. C. B. Horwood to the discussion before the Institution of Mining and Metallurgy on Mr. Rickard's paper. If we remember aright, about ten years ago—in 1905—Mr. Horwood stated publicly, in print, that on the Rand there was a decrease in value with depth in the banket, and that such decrease was only to be expected in gold deposits like those of the Rand formed after the manner of ordinary gold-quartz veins by ascending, deep-seated mineralizers. The details he now furnishes in connection with Mr. Rickard's reference to the Przibram silver-lead mines, of Bohemia, will also be of interest to our readers. We may note in passing that Mr. Horwood has now closed his replies to the discussion on the series of articles on "The Rand Banket," which have been appearing in the *Mining and Scientific Press*. It was somewhat remarkable that in those discussions the ones that were most cordial and showed the greatest appreciation were from Americans, like Lindgren and Kemp, the world renowned authorities on ore deposits.

Manicaland Gold.

In the returns with which the Director for Mines, Macequece, has favoured us there is a detailed schedule of the results from the various mines under his jurisdiction. This appeared in our last issue. The principal producers were:—Braganca, 1,082 ozs., value £17,015; South Firenza, 327 ozs., value £1,363; Wednesday, 285 ozs., value £1,193. The feature was that the Manica Alluvial, owned by the Andrada Mines, Ltd., recovered 10,374 ozs., valued at £43,328. Silver was recovered to the value of £339, and the value of the total recovery, gold and silver, was £64,412 13s. 1d.

* * * *

Zinc Smelting.

Plans for building a large zinc smelter at Swansea, Wales, to treat Australian concentrate, are reported to be temporarily in abeyance, says the *Mining and Scientific Press.* The alternative plan of arranging for treatment in the United States through one of the existing zinc smelting companies or a new plant to be built by one of the larger metal companies, is also still under discussion, says the *Mining and Scientific Press.* Great changes in trade movement cannot be made in one day and, for example, there is a question whether ore contracts with the German smelters have been terminated by the war or merely suspended. Profound changes in zinc smelting seem certain to result from the present war, but just what the changes will be cannot yet be stated with certainty.

* * * *

The Native Press.

In its last issue *Abantu-Batho*, the native weekly, has the following:—"We regret to observe that the management of the newspaper *A.P.O.* finds it difficult to continue the publication of that most useful and wide-awake fortnightly which has done so much excellent work for both the Coloured and Native People of this country. It is rare, very rare, in this country to come across a newspaper that is not run—more or less—in the interests of a certain political party or clique or that is free from the trammels of the obtrusive mining magnate who would subject everybody under bonds of opulency, so as to render him incapable of raising a voice in remonstrance against the many evils emanating from the peculiar conditions of this country where Mammon rules supreme." "Bonds of opulency" is good!

* * * *

The Tin Market.

Writing to us in mail week, Messrs. H. R. Merton & Co., Ltd., state: The tin market opened the week with a considerable display of strength, first prices paid being £155 cash. This level could not be maintained, however, and after some fluctuations the market closes the week steady at £152 cash, and £145 three months. The outside demand being mainly for early delivery, has caused a continued good enquiry in the market for cash tin, whilst three months delivery, although not altogether neglected, is much less in request. Consequently early delivery remains at a high premium. Business done in the East has been at full prices, although not particularly large as far as turnover is concerned. Here there is a continued satisfactory export enquiry. America is buying rather cautiously, but manufacturers are not at all well covered, and will have to come into the market soon.

* * * *

Copper Outlook.

Directors of copper properties with resources are trying hard to pierce the future regarding two points: (1) When will the war end? (2) What will happen afterwards? On the latter question they will be glad to have the opinion of Mr. John D. Ryan, president of the Amalgamated Copper Co., who, in a recent interview, said preparations should be made for tremendous business activity following the war. That he is acting up to his conviction is proved by the fact that the Anaconda Copper Co. is contemplating an expenditure between £1,000 000 and £1,250,000 to improve the percentage of recovery, thereby adding 50,000,000 pounds of copper to the company's annual output without increasing the tonnage of ore handled.

Fewer Accidents on West Rand.

Largely no doubt owing to the efforts of Mr. R. A. Archbold, the Department Inspector of Mines, and the "Safety First" Committee, during the year there was a satisfactory decrease in the number of accidents on the mines in the West Rand area as compared with the preceding twelve months. The 1914 figures are:—Europeans, 14 killed and 47 injured; natives, 145 killed and 355 injured; while those for 1913 were: Europeans, 14 killed and 71 injured; and natives, 161 killed and 393 injured. These figures include not only underground accidents, but also those on the surface; and in this connection it is interesting to note that, whereas 67 accidents in connection with machinery were reported in 1913, only 31 were reported in 1914, and of these only four were fatal. There were 38 prosecutions for more serious contraventions of the Mines and Works Regulations in the various Magistrates' Courts, and of the accused eight were mine managers, overseers and shift bosses. Two hundred and seventy petty contraventions were dealt with by the Inspector of Mines and his assistants, and of these 270 cases were reported by the various mine managements. This may be taken as proving that mine managers are interesting themselves wholeheartedly in seeing that the regulations are being carried out, and it is probable that this is also in a degree responsible for the reduction in mine accidents.

* * * *

Municipal Rating Rolls for 1915.

In accordance with the provisions of Section 59 of the Rand Water Board Extended Powers Ordinance No. 48 of 1904, the amounts shown in the second money column of the schedule given below have been notified by the Town Clerks of the various Local Authorities within the limits of supply as the total valuations of rateable property within the areas of such local authorities, as at the 1st day of July last. The first money column of the schedule shows the municipal valuations for last year, and the final column the increase or decrease of the valuations for the year 1915 as compared with those for 1914.

Municipality.	Total Valuation.		Increase + or Decrease –
	1914.	1915.	
Johannesburg	£32,689,622	£33,328,277	£638,655 +
Germiston	2,811,766	2,613,937	197,829 –
Krugersdorp	1,765,897	1,776,509	10,612 +
Boksburg	1,856,414	1,649,734	206,680 –
Roodepoort-Maraisburg ...	1,082,552	1,082,552	——
Benoni	1,794,227	1,794,217	10 –
Springs	295,130	306,510	11,380 +
	£42,295,608	£42,551,736	£256,128 +

* * * *

State Aid to "Outside" Mining.

In reviewing the accounts of the Mines Department, the Auditor-General notes that £250 was paid to a prospector as a grant towards the expenses of an expedition in connection with the location of a diamond pipe alleged to have been discovered in the Kalahari Desert. The Dolly Boy Syndicate got grants amounting to £590 on the £ for £ principle for developing a property on the Mpapala Goldfields, Zululand, but had no luck, and went into liquidation in August, 1913. Some four years ago a Pilgrims Rest syndicate was given a loan of £2,500. It paid the first instalment and interest, getting its debt down to £2,422, but at the end of March last year its debt had got up to £2,469. Some £11,889 was expended by the department during the last financial year in assistance for district mining development, though the amount voted was greater.

* * * *

Boring for Main Reef at Benoni.

Some time ago we published an article giving reasons why it was considered that the Main Reef should be struck near the northern boundary of Mr. J. H. Humphreys' block of claims on Benoni in that block, and dipping through nearly the whole of it, and afterwards Mr. J. Mills-Davies contributed an article, published in this paper on the 29th November, 1913, with a map exemplifying it, in which he corroborated the contentions we had set up in the article of the 11th October, 1913, as to why the Main Reef should be struck in the block of ground in question. Mr. Mills-Davies based his contention on the ground that a certain distance north of the claims were to be found the Kensington quartzite and shale beds, the Government Reef, the Coronation series and the Hospital Hill shales and quartzites in their proper respective positions. Since these articles were written Mr. Humphreys has continued his boring operations and has succeeded in not only striking the shale bed which runs north of the red bar of the Main Reef but the red bar itself. He immediately put his drill about the same distance south of the shale bed as the Main Reef is south at Langlaagte, and the cores from that borehole are typical of the quartzites in which the Main Reef lies. We understand that the mining men who have seen the core are agreed on this point. Unfortunately for Mr. Humphreys, but fortunately for the farmers, heavy rains ensued with the result that there are 400 to 500 feet of water round his drills, and he cannot continue the drilling until they are accessible. As soon as he is in a position to continue such boring we understand Mr. Humphreys will do so, and once for all finally solve the question.

* * * *

New Charters for Mining Institutes.

The Institution of Mining Engineers and the Institution of Mining and Metallurgy some months back came to the conclusion that the time had come to apply for a Royal Charter, and petitions to His Majesty the King were accordingly presented to the Privy Council, praying for this favour, which, we are informed, has now been graciously granted by His Majesty in both cases. These learned bodies have our sincere congratulations upon this notable event in the history of their respective developments, the progress of which has been so marked a feature of recent years. The possession of a Royal Charter will help these institutions to the attainment of the objects which each has in view, and particularly will it assist in the maintenance of a high standard of proficiency and professional conduct among their members, and in the promotion of knowledge by which the science of mining can be advanced. Coal mining has, from the nature of things, taken a prominent position in the papers and discussions of the Institution of Mining Engineers, and perhaps the most conspicuous work of this institution from the early days, preceding the federation of its constituent bodies, to the present time, has been connected with the application of scientific methods to the practice of mining and the promotion of the safe working of collieries. With regard to the Institution of Mining and Metallurgy, there is fortunately a complete absence of rivalry with the older institution. Its objects are now defined as for " the advancement of the science and practice of mining in respect of minerals other than coal, and of metallurgy in respect of metals other than iron." Important as coal and iron undoubtedly are, there is still an enormous metalliferous field available for the mining engineer, and as metallurgical knowledge advances, so does the demand increase for the non-ferrous metals, which, although not used in such large quantities as iron, are no less indispensable to industrial activity. The members of the institution (some 2,500), which is now about twenty-three years old, are engaged in all parts of the world. The benefits they have conferred upon civilisation are incalculable, and they are constantly striving to advance the science and practice of mining and metallurgy and to raise the status of the profession. " It is," said the President (Mr. Bedford McNeill), at the opening of the house of the institution in Finsbury Circus last year, " our belief in the higher aims of our institution (which by appropriate tests excludes the unqualified) that has induced us to enrol ourselves as members, and this is the reason why we are about to petition the King in Council to grant us a Royal Charter —a charter which will recognise our corporate existence as metal miners and metallurgists, and by that recognition confer the right of doing still more good for the community." South African members will be particularly proud of the honour now paid to both bodies.

TOPICS OF THE WEEK.

THE FAR EAST RAND AGAIN.

It is an open secret that the necessity for augmenting the revenue of the country has again directed the attention of the Government to the dormant mining areas of the Far East Rand, and the recent speeches and public statements made on that subject may therefore produce fruit. With the expenses of the war in German South-West daily mounting up, and the public revenues of the Union steadily shrinking, it is clear that the Government can no longer turn a deaf ear to those who advocate the early development of the large and promising auriferous area in the Far East. Moreover, thoughtful people are beginning seriously to fear a shortage of employment on the Rand when those now fighting for the Empire and the Union return to these fields. And, further, there is the incontestable fact that within five years several more of the outcrop mines are threatened with exhaustion, and their places must be taken if the productive ascendency and importance of the Rand is not seriously to suffer. For all these reasons we believe that war or no war the problem of the East Rand must soon be tackled, and the complexities that surround it faced and unravelled. And largely because we consider the matter must be kept before the Government and the public, we print this week a very spirited and sincere appeal from a correspondent, who seems to have, at any rate, thought and felt deeply on the need for Government action. His economics may or may not appeal to our readers; they cannot fail to provoke discussion. Moreover, the mining industry, to our mind, owes it to itself to give the matter every consideration, if only on the lowest grounds of self interest. The understanding with the Government may be, for all we know, that the new imposts are of a strictly temporary nature, i.e., for the period of a year, or for the duration of the war, whichever be the longer. But in practice we all know taxation of this kind is seldom remitted even when the special causes or excuses for it have passed away. The history of the growth of the British Income-Tax will illustrate our meaning and lend countenance to our apprehension. Therefore, if the total volume of taxation on the industry is likely to remain a constant it behoves the victims to see that the industry be broadened so that individual burdens be lightened. And this brings us to the evaluation of the untapped areas of the Far East by those most competent by expert knowledge and local experience to judge. It cannot be said that the only official estimate of those areas is of a very hopeful nature. Neither is it hopeless, and if an ultra-cautious note prevades that opinion, the circumstances, if examined, will be found ample justification. The estimate in question was embodied in the now famous evidence submitted by the Chamber of Mines to the Economic Commission last year. According to that evidence there are in the far Eastern Rand, approximately 86,000 claims under which the Reef is known to lie at varying depths, the mining rights of about four-fifths of which are vested in the State. It is impossible to forecast, even within wide limits, the amount of workable ore which this large area will eventually produce, and consequently the extent to which it bears upon the future life of the Witwatersrand. The exact wording of the evidence was: " A good deal of exploratory work by means of boreholes has been carried out, and although prospecting through this medium is admittedly very unreliable, the results have not been encouraging, and therefore a considerable portion of this area must be regarded as of doubtful mining value. This portion of the Witwatersrand contains only one reef, lying at a slight inclination from the horizontal, and therefore, at best, the tonnage per claim will be considerably less than that of the claims in the Central Rand." And again: " The areas above referred to on the far Eastern Rand contain hundreds of millions of tons of ore, but an enormous capital outlay, the extent of which it is needless to discuss now, will be required for its development. Indications as to value are admittedly very meagre. The little evidence which they do furnish is not of a very favourage character. It is also of some interest to point out that the characteristics of this region are not quite similar to those of the Central Rand. In the East Rand the gold is deposited largely in specific sections, some of which are likely to contain good values, while others are likely to be practically barren." "The essential point to bear in mind," the Chamber added, "in attempting to form any estimate of the future of gold mining in this part of the Transvaal is that under the existing working conditions the field is not attractive to capitalists." Fortunately, the shortcomings of the field from the mining investors' point of view are not such that they cannot be overcome by sympathetic enlightened Government action. This, we can only hope, will be brought appreciably nearer by the combination of urgent circumstances set forth in our opening remarks. The result cannot fail to benefit all concerned—Government, industry and people.

ACCIDENTS, MINERS' PHTHISIS AND ALCOHOL.

It is significant that the biggest group of mines on the Rand has adopted the practice of issuing leaflets warning the miners against the dangers of alcohol. This proves, if anything were needed to prove, that the part played by drink in causing accidents and increasing disease on the mines is now fully recognised in responsible quarters. Some of these leaflets, which we have been permitted to examine, are dramatic in their eloquent brevity and make a direct and immediate appeal. For ourselves, we have long been convinced that alcohol is a large factor in causing the high accident rate on the mines and that it is likewise a predisposing factor in the spread of miners phthisis. In regard to accidents due to cerebral confusion or mental obfuscation produced by alcohol, authorities are agreed that the number of accidents which come under this heading is simply appalling. Many are due to the irritant action of alcohol, which leads men and women to attack and injure other human beings. Numberless other accidents are the result of falls, miscalculations as to distance when moving about amongst machinery, unsteadiness of gait, shakiness of arm and hand, etc.—all these being due to the depressing and poisonous effect of alcohol upon the brain and the nervous system generally. Sir Victor Horseley, in his book on the subject says that some years ago (1884) Dr. A. G. Millar, F.R.C.S.E., surgeon to the Edinburgh Royal Infirmary, made a careful statistical report concerning the incidence of accidents admitted on different days of the week during the year 1880. As the public-houses are closed on Sunday in Scotland (there has been Sunday closing in Scotland for fifty years), excessive drinking is limited to Saturday after wages are paid: Average number of accidents per day, 5·65; average number of accidents each Saturday, 8·38; average number of accidents between midnight on Saturday and 6 a.m. on Sunday, 1·88. This makes the average total for Saturday and Saturday night 10·26, *i.e.*, nearly double the daily average of accidents throughout the week. Between 6 p.m. on Saturday and 6 a.m. on Sunday the average was 6·08, whereas between the same hours from Sunday to Monday the average was less than 1 (*i.e.*, ·9 per cent.). Injuries to the head occurred four times as frequently on Saturday nights as on ordinary nights, and on Sundays there were practically none. Again, innumerable accidents are due to nothing else but mental stupidity and slowness on the part of persons who normally have "their wits about them," but who, in consequence of taking alcohol, do not quickly enough grasp the bearings of a situation, with the result that an accident occurs. In Belgium it is calculated that 43 per cent. of the accidents in mines and factories are due to alcohol. In America (although the amount of alcohol used on that side of the Atlantic is very considerably less per person than in the British Isles) stringent regulations exist on some of their largest railways as regards demanding total abstinence while the men are on duty. Meanwhile, we know only too well that every year thousands of accident, casualty, and emergency cases due to alcohol are brought to the hospitals for treatment.

> Again, in the case of illnesses such as pneumonia—which predisposes to miners' phthisis—and blood-poisoning, which are caused by microbes now thoroughly well known and identified, it is proved that the alcoholic habit notably diminishes the power of the tissues to resist the invasion by these same organisms. It is a recognised clinical fact that a drinker is less resistant than he should be to attacks of consumption, pneumonia, and blood-poisoning in all its forms. Alcoholism is believed by many to predispose to pneumonia. Thus Dr. Raw, the Medical Superintendent of the Mill Road Infirmary, Liverpool, when relating his experience in the treatment of 1,047 cases of pneumonia, with 246 deaths, said: "Alcoholism is the most potent predisposing factor, and I have now come to look upon the previous alcoholic condition of a patient as the arbiter of his life when attacked by pneumonia." With regard to treatment, it is now accepted that any routine treatment with alcohol involves grave risks. Dr. Muirhead, of Edinburgh, pointed out years ago that the death of a case of pneumonia uncomplicated by alcoholism was of the rarest occurrence, and that patients recovered without its use medicinally. Even when this disease is complicated by influenza, there are not wanting physicians of experience who triumphantly "pull their patients through" by means of drugs other than alcohol, which, indeed, they regard as especially deleterious in cases already suffering from influenzal poisoning. Sir Victor Horsley explains the twofold way in which alcohol renders the lungs liable to disease. First, he says, let is be remembered that persons with whom its use is habitual are more liable than others to an irritation of the mucous membrane of the throat, which they are always attempting to "clear." This is not in itself dangerous, but when a similar condition of catarrh supervenes in the large tubes of the lungs, the healthy condition of these disappears, and the patient becomes more liable to bronchitis and to infection by the germs of tubercle and pneumonia. Secondly, the repeated taking of alcohol leads to a dilatation of the blood-vessels of the lung, and these vessels being extremely numerous, a tendency to congestion occurs. Lungs in this condition of incipient congestion are readily affected by climatic falls of temperature, and by the presence of bacteria, and the outlook when such lungs become actively diseased is proportionately serious. At the International Congress on Tuberculosis, which met in Paris in 1905, the following resolution was passed:—"That in view of the close connection between alcoholism and tuberculosis, this Congress strongly emphasises the importance of combining the fight against tuberculosis with the struggle against alcoholism."

These facts plainly point their own moral, and can be left without comment to speak for themselves.

A Stock Exchange Hardship Removed.

The hard-and-fast adhesion to the regulation as to "physical possession" of securities since September 30 "in the United Kingdom" has been relaxed on the London Stock Exchange. There is not to be strict enforcement of this regulation, official permission by the Committee in some cases having been accorded whereby securities, including mining shares, that have stood in the name of residents with addresses in the Colonies, or even some neutral countries, and which consequently have not been in physical possession in the United Kingdom, have been sanctioned for delivery. This permission has only been given after very strict examination of the circumstances of each individual application. The regulation, of course, was too drastic. It prevented a Colonial, especially as to Australia and South Africa, in respect of mining shares, from being able to dispose of his shares as usually has been done *via* the medium of the London Stock Exchange, for the sole reason of the securities not having been in "physical possession" in the United Kingdom. It is asserted that the prevention of delivery of shares out of the name of Colonial holders has contributed to the rise that has occurred in the price of Modderfontein shares, to give one instance only, so many shares being in names of Colonial holders with addresses in a colony or in names of English or friendly alien owners with Continental addresses. If safeguards are taken to prevent alien enemies with addresses abroad effecting delivery, it also prevents alien enemies even with addresses in South Africa from doing harm. In connection with the Modderfontein enterprise, however, the improvement in the shares, we take leave to think, is due to a tardy recognition of the intrinsic merits of the mine itself rather than to the floating supply being restricted through a large number of shares being registered in names of people with addresses abroad.

THE MODDER DEEP'S INITIAL PERFORMANCE.

A Satisfactory Start—Normal Returns Expected for March—Ore Reserves at End of 1914 May Equal Eight Years' Supply to Mill.

As the first returns from the Modder Deep Levels did not reach us till we were on the point of going to press last week, it was not possible to offer any comment on them. That they are most satisfactory, of course, anyone can see. The trial crushing started on the 14th of December, and during that month the whole of the reduction works was thoroughly tested and proved satisfactory. From the 1st of January the entire plant ran constantly, the tonnage crushed for the month—including 2,326 tons from the dump—amounting to 25,750 tons of about 9 dwts. grade. The tonnage completely treated was naturally much less and a large quantity of gold has been absorbed in the plant. Further, in order to put the plant in good condition, only a partial clean-up was made. The total gold recovered was 8,105 ozs., value £34,345. Costs amounted to £26,383, and the profit inclusive of sundry revenue was £8,030. It is too soon, of course, to attempt to draw final conclusions from the figures, and as this is a short month we cannot expect working costs and yield to approximate to normal until March. No quarterly report, it will be noticed, was issued for the three months ended December 31, but it is understood that a re-estimation of the ore reserves as at that date has been made, and we shall not be surprised if the total as at December 31, 1913, be doubled in quantity and improved in value at the end of 1914. It will be remembered that at the end of 1913, when the footage sampled totalled 13,147, the first computation of ore reserves was made. The result showed, as detailed in the reports, the total quantity of fully and partially developed payable ore to be 1,173,000 tons, assaying 7·5 dwts., or 31s. 10d. over 73 inches stoping width. There were an additional 300,000 tons in respect of which some development had been done, the values of which indicated it to be probably payable ore. Including this latter tonnage, there were, at the end of 1913, about four years' ore reserves in hand. As since that date development has continued at a rapid rate and the value of the footage sampled has further improved, it is obvious that when the ore reserves are computed as at the end of 1914, a large increase will be shown. It looks as if the mine would start production with as many years' ore reserves in hand as any mine now working on these fields—a factor which is sure to be of immense benefit. The average value of the ore reserves give a good indication as to the yield to be expected, and in this connection it must not be overlooked that development values have steadily improved. Working costs should be low, as the width of the reef is large, and payable ore exists in large blocks—a noteworthy feature being the consistency of values over long stretches in the drives as well as in the raises and winzes—and development, in view of the quantity of ore reserves, will not have to be pushed. Further, the plant is, of course, designed to take advantage of every modern improvement and the mine will benefit both above and below ground from the use of the most up-to-date labour saving appliances. The prospects for this, the Rand's newest producer, are therefore excellent.

POSITION OF HAENERTSBURG GOLD AND COPPER.

Report of Annual Meeting of Shareholders.

The first ordinary general meeting of shareholders in the Haenertsburg Gold and Copper, Ltd., was held at the Grand National Hotel on Monday night, when about 7,000 shares were represented. Mr. W. Holman James occupied the chair. In the directors' report it was stated that owing to the war and the rebellion they had not been able to place shares to redeem the bond held over the company by the Haenertsburg Syndicate, and for the same reason the refractory ore process had been deferred. The results of development had been consistently good, and after a visit to the mine in September, Mr. J. R. Williams, the Consulting Engineer, reported that there was available for immediate stoping a considerable tonnage of ore which would give a minimum return on the plates of 6 dwts., and that on this basis, by crushing 750 tons per month a profit might be expected of about £400 per month, and he strongly recommended the starting up of the battery. Mr. James was in England then, but when he returned he underwrote 500 shares to provide extra capital, and work had been begun. Mr. James further informed the meeting that since the report had been printed the bond held by the Haenertsburg Syndicate had been redeemed. He also stated that within the next month the property would be a paying proposition. After the adoption of the report Mr. Williams addressed the meeting on the work that would be done at the mine. When they started the Government refused to allow them explosives for fear that the rebels should get hold of them, but a start was made on the soft area and the results had been most satisfactory. It would be said that on the other side of the dyke which ran across the property there was no reef, but they would cut through it, and two samples had assayed at 168 dwts. and 171 dwts. of gold to the ton. He did not want them to run away with the idea that that was the average value of the mine, because occasionally the reef was as narrow as a pencil mark and wanted careful watching, but they would make a recovery on the plates alone of not less than 10 dwts. per ton, while the working costs would not exceed 10s. They had had almost insurmountable difficulties to face. From November to the end of January 73.4 inches of rain had fallen, and there was not an adit in the district that had not fallen in. This had stopped milling, and thanks were due to the manager, Mr. Carter, that there had been no accidents and not a ton of ore had been lost. He hoped that work would be resumed again, however, in a day or two. Colonel Hutchinson paid a tribute to Mr. James's work, to which he said they owed the whole of their present position, including the wiping out of the bond. The Chairman suggested that the new directorate should consist of himself, Colonel Hutchinson, and Dr. Murray. Mr. James, Col. Hutchinson, and Dr. Murray were elected directors for the ensuing year, and the retiring directors were allotted 400 shares as remuneration for their services. Messrs. F. W. Diamond and English were appointed auditors in place of Mr. Robert Hemphill, who retired, and was voted twenty guineas for his services to the company. The meeting closed with votes of thanks to the Chairman and Mr Williams.

Lancaster West. The secretary of the Lancaster West Gold Mining Co., Ltd., in a circular to the shareholders, states that the annual report for 1913 disclosed the precarious financial position. The funds available sufficed to provide for payment of claim licences to the end of July last, and the debenture interest which fell due on July 1 last. The total outlay involved for these purposes was £5,994. The trustee for the debenture holders advanced £2,230 for claim licences out of funds paid to him, representing sales of sundry machinery. The board of directors has made endeavours to arrange for the financing of the company but without success, and it is impossible to continue the renewal of claim licences and to make provision to meet the debenture interest, amounting to £2,963, due on January 2. The estimated liabilities at December 31 last, including redemption of outstanding debentures value £98,780, were £109,597, against cash and cash assets amounting to £359, which liabilities have since been increased by the amount of the debenture interest due on the 2nd inst. It is clear that there is no alternative but liquidation, and therefore the board of directors have petitioned the court for a winding-up order, and a rule nisi was granted.

THE PREDOMINANT PARTNER IN THE RAND MINING INDUSTRY

A Spirited Plea for the Realization by the Union Government of Its Responsibility and Opportunity in Regard to the Far East Areas.

[FROM A CORRESPONDENT.]

A REMARK made by the Chairman at a recent shareholders' meeting contained a suggestion which is of considerable general interest. It was to the effect that the question of provision of the capital necessary for the exploitation of the known gold bearing areas not yet opened is no longer a parochial one, or one limited to the shareholders in the particular company concerned, but is one where State aid is legitimately proper, reasonable and economically sound. This is a matter deserving of careful consideration. Up to the present time the provision of capital has been left to individuals and groups. These latter have in course of time by reason of amalgamations and absorptions been so reduced that we have now arrived at a point when practically almost the whole gold industry of the Witwatersrand is controlled by a few groups, and if they do not approve of the conditions of any project no capital is forthcoming. We are, it is true, in the throes of a serious war at the moment. But we have not been always so, nor shall we always be so, and now is the time to consider ways and means for rendering our house habitable and comfortable—which for some years past it has not been. To put it crudely, as it strikes the average man, we are in the midst of a district the most richly endowed by Nature of any in the world; we are all hard-workers, and we are all hard-up. And when Johannesburg is poor, it is only a matter of time for its poverty to react on the rest of South Africa. If we cannot buy, the bulk of the remainder of the community of the Union cannot sell. It is our duty to find out where the mischief lies and to seek for and apply a remedy.

PREDOMINANCE OF GOVERNMENT EXPLAINED.

The speaker above-mentioned referred to the Government as the predominant partner. The expression is absolutely correct, but perhaps the average man does not always grasp the fact. Of any known gold-bearing farm, the Government—and that is the general body of citizens—owns four-fifths of the mineral rights, and only the remaining fifth belongs to the so-called owner of the farm. This owner merely owns the surface rights, and even they almost disappear on proclamation of the farm under the Gold Law.

WHY STATE LEASES FAIL.

Hitherto the Government have been content to let their four-fifths be exploited by private individuals and groups. A notable instance of this is the Government Areas (Modderfontein). There was a certain amount of competition for the lease in this case, and the result was that the Government obtained fair terms. On the next attempts to dispose of similar leases, however, the result was that there were no offers at all. This was in the instances of Brakpan and Witpoort. The Government, thus rebuffed, made no further attempts, and so we have the properties named, with other huge areas of State mining rights on the far Eastern Rand, lying fallow and useless. And they will remain so, if we do not bestir ourselves, until such time as we are prepared to hand them over to private capitalists on those capitalists' own terms. We hold no brief against the capitalists. They deal in money in bulk, and they want to drive the best bargain they can for it. But we are under no compulsion to sell our birthright for a mess of pottage. We can exploit it ourselves, and we must do so.

STATE AID NOT A NEW PRINCIPLE.

The principle of State aid for commercial enterprise is not new. It is well known that the enormous growth of German trade has been fostered, encouraged, and strongly pushed by an extensive system of State bounties and subsidies. Other countries have acted in a similar manner with successful results. Even in conservative Britain the State has recently extended the principle even so far as to guarantee private commercial acceptances, and even to finance the aniline dye industry on the pound for pound principle. This had an immediate and most beneficial effect upon the general credit. Let us apply that principle to our own case. Capitalists are unable or unwilling to supply the money required to bring our known payable gold-bearing areas to a producing stage. Four-fifths of the gold in those areas belong to the State. Let the State provide the capital required or guarantee interest upon it. There is no more financial risk in mining in proved areas, such as those of the far Eastern Rand, than there is in running State railways or harbours. The old bogey of Socialism is extinct—we are all, as Mr. A. J. Balfour says, Socialists now. Let no one think that this subject is an academic one. It is a practical one—one of vital importance to every individual. The gold is there, under good economical mining conditions. The gold is wanted by the State, by the Empire, by the world. Its extraction will provide remunerative labour for thousands, and the resultant circulation of money will provide trade and occupation for thousands more. And the profits on the gold won will provide that revenue which the State sorely needs. And on these questions of provision of employment, general trade and State revenue, the position is more serious than is generally grasped. We are apt to ignore the conditions of the to-day producing mines. Of those mines, many have but a few years of production before them. If the district of the Witwatersrand is even to maintain its present limited prosperity, other mines must be brought to the productive stage to replace the ones worked out.

A PRACTICABLE SUGGESTION.

There are no insurmountable technical or practical difficulties which can be urged against the suggestion. The Government have able technical advisers, and in case of need, an Advisory Board could be called to assist from the number of highly skilled and qualified mining engineers we have in the country. The adoption of the proposal would commend itself to the imagination and to the commonsense of the community. It is one in which every man, woman and child in the Union has a direct personal interest. It is a vital question, bearing directly upon whether we are to become prosperous or gradually decay, or drift in a supine dependence upon the goodwill or convenience of one or two groups of people who control the money. We have no doubt as to what the response of the public will be, and we shall be greatly surprised if the matter is not made one of most urgent import at the next elections. It is no party question. It is one which should be tackled urgently and insistently, and not allowed to drop. We have plenty of urgent problems, but none more urgent than this, for it involves the question of our continued well-being, if not our very existence.

Luipaardsvlei Estate Water Troubles.

During the month of January, 1915, this company crushed 16,020 tons, the operations for the month resulting in a loss of £316. The mill was hung up for portion of the month owing to the excessive amount of water, and extra pumping expenses added to the working costs. The lower levels in the mine were flooded, and in order to save the main pumps hauling of rock had to be discontinued whilst the baling of water at every shaft was resorted to: this has been carried on well into February.

PROGRESS OF SANITATION ON RAND MINES GROUP.

Some Notable Improvements—Innovations in Native Housing and Diet—Questions of Sewage and Garbage Disposal—Extracts from the First Annual Report of the Superintendent of Sanitation to the Rand Mines, Ltd.

In his first annual report, Dr. Orenstein, Superintendent of Sanitation to Rand Mines—Central Mining group, writes, *inter alia*:—This report covers the months of May to December inclusive, as, although I commenced my duties in the latter part of March, very little was done during the first month.

Sewage Disposal.

During the last eight months of the year, considerable progress was made with the installation of water-borne sewage on the mines of this group. The Crown Mines sewage disposal plant was completed, and at present all the compounds of the Crown Mines, with the exception of the Robinson Central Deep and Bonanza, are provided with water-borne sewerage. The native hospitals are also connected with the system, and so are a number of miscellaneous quarters on the property. It is the intention of the management to greatly extend the water-borne sewage system of this property, and, in the interest of the health of the employees, I earnestly hope that this work will be pushed with all possible celerity. At the Modder B. the existing sewage disposal plant is being reconstructed, and would have been probably completed by this time were it not for the delay in obtaining the pumping plant. Owing to the unfortunate attitude of the Town Coouncil towards the connecting of the mine compounds to the town sewers, the extension of the water-borne system to the Ferreira Deep, the City and Suburban, and perhaps one or two other mines of this group could not be carried into effect. I wish to record here that the Medical Officer of Health, Johannesburg (Dr. Charles Porter), has done everything in his power to induce the Town Council to deal promptly and definitely with this important question. This matter was also made the subject of a special communication from me to Dr. Porter. I regret to report that up to date nothing has apparently been done in this matter by the Town Council. The attitude of the Town Council is particularly unfortunate, inasmuch as it blocks progress along an avenue of great importance to the health of the community. There can be no question that the universal installation of water-borne sewage would influence to no inconsiderable extent the morbidity and mortality of the mine population. It would be an effective safeguard against outbreaks of epidemics of certain diseases, particularly enteric fever and dysentery.

Garbage Disposal.

We have endeavoured during the year to extend on the mines of this group the practice of garbage disposal by incineration, and I am very glad to be able to report that quite a number of the mines of this group have installed garbage destructors within the last few months, and I hope that all the mines will adopt this system of garbage disposal in the near future. The collection of garbage has also been put on a very much more satisfactory basis. Particularly is this the case at the Crown Mines, where a very complete system of standard garbage pails has been installed. The insanitary method of burying garbage, or what is actually the case in most instances merely more or less ineffectual attempts at burying it, under the toes of dumps, etc., cannot be abandoned too soon.

Sterilisation of Water.

A small series of enteric fever cases having occurred on the New Modder and Modder B., it was decided to sterilise all water used underground on both these properties. Hypochloride sterilisation plants have been devised and were put in operation during the month of September. Since then several bacteriological examinations of the water have shown it to be equal in quality, from the bacteriological point of view, to the best potable waters. Enteric fever has disappeared on both these mines.

Housing of Natives.

At the City Deep, 16 of the compound rooms, with a capacity of over 600 boys, have been equipped with individual partitioned-off bunks. The new compound at the Modder Deep (Goerz & Co.) has been equipped on the cubicle system, after designs prepared, with your kind permission, by me. The provision of individual bunks is an important step in the right direction. I am convinced that the installation of individual bunks would result in a considerable reduction in morbidity and mortality. Plans for a native village of 120 two-room cottages at the Modderfontein B. have been worked out, and the construction will be taken in hand forthwith.

Diet of Natives.

Experiments are now under way, through the kindness of Sir Arnold Theiler, of the Government Veterinary Research Laboratory, to establish the "Vitamin" value of the principal article in the diet of the mine natives—maize meal—or "mealie meal" as it is called. A fair start has been made in installing efficient plants for the making of "mahou," which is a thick brew of fermented maize flour. It has been the custom to allow the boys to make their own "mahou." This practice was conducive to a considerable increase in the untidiness of the compound rooms. Following a circular letter to the managers of the mines of this group, recommending the installation of "mahou" making plants and the prohibition of "mahou" making in the compound rooms, the Native Affairs Department issued an order along the same lines. A desirable improvement in the dietary of the natives would be the substitution of roasted beef for the boiled beef at present issued on almost all mines. Boiled beef has not nearly the dietetic value of the properly roasted article.

Miscellaneous.

A small laboratory was equipped at the end of the year for such routine chemical and microscopical work as needs to be done by this department. This has enabled us to discontinue sending chemical work to a private laboratory, as was done heretofore. It will also enable us to do certain work which could never have been accomplished without this laboratory. The directors of the Central Mining—Rand Mines group have established a semi-annual prize to be awarded to the compound manager showing the best efforts in the suppression of fly-breeding. The first prize under this vote was awarded recently to Mr. McKenzie, the compound manager of the Crown Mines, Ltd. I desire to record my appreciation of the co-operation and many courtesies of the officials and staff of the head office, the managers and staffs of the mines, the Director and staff of the Native Affairs Department, and the Johannesburg Medical Officer of Health and his staff.

New Heriot.

The New Heriot milled 12,800 tons, and recovered 5,702 ozs. at a profit of £10,028, in January.

Brakpan Mines.

The following information is supplied in respect of the January, 1915, output: Stamps working, 140; running time, 30 days; ore crushed, 55,560 tons; tube mills working, 62,951 tons, ore from dump, nil; waste sorted, 11·32 per cent; fine gold declared, 18,477·69 ozs.; value declared, £77,813, equal to 27s. 6·18d. per ton milled; working costs, £51,575, equal to 18s. 2·85d. per ton milled; working profit, £26,238, equal to 9s. 3·33d. per ton milled.

RAND PROFITS, DIVIDENDS, AND YIELDS.

Attractive Returns—Calculations to Enable the Aspect of Each Security to be Estimated.

The following is a list of Rand dividend-payers, with the highest and lowest points touched during 1914, the dividends paid for the past year, the total dividends paid by each company, the gross return per cent. (calculated upon the full dividends for 1914), and other interesting particulars. In the "amount required to pay 10 per cent. dividend" no allowance is made for profits tax or for payments to the Government under bewaarplaatsen leases. In some cases working costs appear to be lower than they really are, owing to the inclusion of sundry revenue in the declared profit. Lives are not estimated in the table, as they naturally vary with the increase in the reduction plant and the quantity of low-grade ore brought within the milling range by the lowering of working costs:—

Share.	1914. H.	1914. L.	Dividends. 1913.	Dividends. 1914 (1)	Dividends. (2)	Total Dividends Paid.	Balance of Profits carried forward at end of last financial Year.		Declared Profit for 1914.	Prior Charges on Profits.	Amount required to pay 10% Div	Price at Date of Div. Dec.	Gross Return per Cent.
	%	%	%	%	%	£	£		£	£	£	%	£ s. d.
MINING COS.													
Bantjes Cons ..	7/8	9/16	7 1/2	2 1/2	2 1/2	119,297	54,291	Dec. '13	31,509	—	50,230	10/3	9 15 1
Brakpan	3	2	32 1/2	12 1/2	17 1/2	768,750	60,876	Dec. '13	283,302	–	75,000	2 7/16	12 6 3
City & Sub. (£4)	2 3/8	2 1/8	15	5 1/2	7 1/2	1,955,000	Dr.22,299	Dec. '13	247,179	—	136,000	2 7/16	24 12 6
City Deep	3 5/8	2 9/16	17 1/2	11 1/4	12 1/2	671,875	145,130	Dec. '13	407,986	-	125,000	2 31/32	8 0 0
Cons. Langlaagte	1 3/4	1 5/16	10	100	10	285,000	113,553	Dec. '13	*310,416	14,850	95,000	1 11/16	11 17 0
Cons. Main Reef	1	13/16	10	5	6 1/4	611,644	65,423	June, '14	130,626	—	92,436	29/32	12 8 3
Crown Mines(10/-)	6 11/16	5 3/8	110	55	30	5,613,264	101,744	Dec. '13	1,180,290	48,890	94,010	4 1/4	9 19 11
Durban-Rood'p't	1 1/8	13/16	10	10	15	1,406,333	29,732	Dec. '13	34,585	—	12,500	15/16	26 13 4
D'ban-R'dp't D'p	1 1/16	13/16	5	3 3/4	3 3/4	242,000	23,780	Dec. '13	55,693	—	44,000	13/16	9 4 7
East Rand Prop.	2 1/4	1 1/2	25	7 1/2	10	6,028,564	168,335	Dec. '13	759,886	63,000	244,589	1 1/2	11 13 4
Ferreira Deep ..	2 9/16	2 1/8	50	25	††25	4,607,750	366,195	Sept, '14	616,461	—	98,000	2 1/8	23 10 5
Geduld	1 11/32	1		—	5	46,125	66,260	Dec. '13	105,853	—	92,250	21/6	4 13 0
Geldenhuis Deep	1 3/8	1	17 1/2	8 3/4	10	2,182,190	127,422	Dec. '13	131,623	–	58,575	1 1/8	16 13 3
Ginsberg	1 3/16	5/8	35	10	7 1/2	455,875	11,229	Dec. '13	*45,188	—	21,000	3/4	23 6 8
Glencairn	1/16	3/32	5		5	531,250	4,428	Dec. '13	*33,338	—	55,000	2/6	40 0 0
Knights Deep ..	1 3/4	1 3/8	17 1/2	5	5	1,398,573	100,608	July, '14	*167,005	2,590	74,352	1 1/8	8 17 9
Langlaagte Estate	1 1/8	7/8	10	5	5	2,758,684	4,542	Dec. '13	186,066	–	88,650	7/8	11 8 7
May Consolidated	1/4	5/32	10			1,500,155	33,565	Dec. '13	5,338	—	28,875	5/-	—
Meyer & Charlton	5 13/16	4 3/4	70	35	35	1,438,308	117,919	Dec. '13	256,454	—	20,000	5 1/4	14 14 10
Modder B	4 9/16	3 3/4	45	25	30	840,000	199,163	Dec. '13	447,870	—	70,000	4 9/32	12 16 11
New Heriot......	3 1/8	2 1/2	70	30	35	1,247,160	75,780	Dec. '13	120,484	—	11,500	2 3/4	23 2 10
New Kleinfontein	1 9/32	15/16	7 1/2	5	5	1,535,279	46,629	Dec. '13	254,543	—	115,154	1	10 0 0
New Modder (£4).	13 3/16	11 1/8	30	15	15	2,297,500	230,114	June, '14	644,692	‡17,310	140,000	12 15/16	9 5 6
New Primrose ..	1 3/32	7/8	60	20	20	2,781,275	21,565	Dec. '13	*136,074	–	32,500	16/-	50 0 0
New Rietfontein..	7/32	1/8	2 1/2	—	2 1/2	1,213,781	10,539	Dec. '13	*5,581	—	61,008	3/-	16 13 4
New Unified	—	–	20	10	10	300,000	20,191	Dec. '13	*61,961	—	25,000	—	—
Nourse Mines ..	1 13/16	1 1/4	20	8 3/4	8 3/4	1,496,029	96,568	June, '14	173,126	—	82,782	1 3/16	14 14 9
Randfontein Cen.	1 7/32	3/4	10	—	–	629,055	—	Dec. '13	814,138	180,000	419,370	11/16	—
Robinson Deep...	1 3/4	1 1/8	27 1/2	12 1/2	10	3,725,186	105,408	Mar. '14	301,731	—	100,000	1 3/16	18 19 0
Robinson Gold(£5)	2 15/16	2 1/2	15	19†	9	10,757,186	523,576	Dec. '13	579,442	—	275,000	2 1/16	43 13 0
Rose Deep	2 1/2	1 7/8	42 1/2	20	15	2,770,625	74,706	Dec. '13	281,974	—	70,000	1 7/8	18 13 1
Simmer & Jack...	21/32	1/2	13 3/4	5	5	5,278,961	85,816	June, '14	*337,669	—	300,000	9 6	21 1 0
Van Ryn	3 3/8	2 5/16	47 1/2	22 1/2	22 1/2	2,032,500	16,165	June, '14	248,822	—	50,000	2 15/16	15 6 4
Van Ryn Deep ..	2 13/32	1 5/8	7 1/2	12 1/2	12 1/2	388,989	46,986	Dec. '13	406,857	—	119,689	2 11/32	10 13 4
Village Deep ..	2	1 5/8	15	10	11 1/4	1,047,508	49,768	Dec. '13	311,199	—	106,067	1 7/8	11 6 8
Village Main Reef	2 3/16	1 5/8	70	35	35	3,572,743	378,430	Dec. '13	350,288		47,200	1 5/8	43 1 1
Witwatersrand ..	3 13/16	3	50	25	25	1,618,994	67,814	Dec. '13	*285,154	—	46,962	3 3/16	15 13 11
Wit. Deep	3 1/16	2	35	15	17 1/2	2,008,752	111,565	Dec. '13	251,063	847	55,000	2 1/16	15 15 3
Wolhuter	25/32	9/16	10	6 1/4	6 1/4	772,000	38,211	Oct. '13	151,034	‡‡7,981	86,000	9/16	22 4 5
FINANCE COS.													
Cent. Mining (£12)	8 7/8	6 1/2	—	2 1/2	—	1,197,500	24,315	Dec. '13	—	—	510,000	6	5 0 0
Cons. Gld. Flds..	2 11/16	1 7/8	10	5	—	5,075,000	84,471	June, '14	—	158,250	200,000	1 1/2	3 6 8
J'burg Cons. Inv.	1 1/8	29/32	5	—	—	3,041,250	170,525	June '14	—	—	395,000	16 6	—
Rand Mines (5/-)	6 1/2	4 15/16	220	110	90	10,567,482	360,418	Dec. '13	—	—	53,149	4 15/16	10 3 6
Randfontein Ests.	1 3/8	7/8	10		—	450,218	278,965	Dec. '13	-	116,529	300,146	7/8	—

* Including sundry revenue. † Including bonus of 10% declared in July. ‡ Annuity to Government for 20 years from April, 1910.
†† A bonus of 25 p.c. was also paid. ‡‡ Per annum for 10 years from October, 1911.

New Kleinfontein.

In January the New Kleinfontein Company recovered 16,006·770 ozs. of fine gold of a net value of £67,138 19s. 6d. The profit was £23,170 18s. 5d. and the total working costs were equal to 16s. 9·572d.

Champ d'Or.

An extraordinary general meeting of Le Champ d'Or French Gold Mining Company, Ltd., will take place on the 20th inst., in Paris, to consider a resolution providing that the capital be reduced from £135,000 to £40,500.

Mine Safety and Sanitation Notes.

MOTION PICTURES AS AN AID TO "SAFETY FIRST."

Prevention of Accidents Committee of the Rand Mutual To Adopt Novel American Ideas. —Rand Mining Films to be Exhibited at African Theatres Trust Halls.

A big step forward has been taken by the "Safety First" Committee in deciding to enlist the valuable aid of the bioscope in the great work of educating the workers of the Rand up to the far-reaching benefits of the growing movement for the prevention of accidents on the mines. The powerful interest and co-operation of the African Theatres Trust have been enlisted in the matter, and the experts employed by that organisation are already busy in preparing films under, of course, actual and realistic working conditions. A beginning, we believe, is being made at the Nourse Mines, and though the lighting question presented some difficulty, this has now been overcome by the use of suitable lamps. By arrangement between the "Safety First" Committee and the African Theatres Trust, the films will be shown at the bioscope halls belonging to the Trust in Johannesburg and along the Reef, and by this means, it is hoped, the greatest educational benefit will be conveyed by the films. The general public, likewise, cannot fail to be interested, and a great deal of indirect good may be effected through the agency of wives and mothers aroused to the manifold dangers of mining operations. Full particulars will be given in due course regarding the time and place of the initial display—"release" is, we believe, the technical expression—of the films, and the industry, as far as we can see, cannot fail to benefit from this latest illustration of the enterprise of the "Safety First" Committee. In this connection the following, taken from the latest *Bulletin* of the American Institute of Mining Engineers reflects the progress made in this direction in the U.S.A.:—

The following described motion-picture film and lantern slides will, on application to the U.S. Bureau of Mines, Pittsburgh, Pa., be loaned or shown by the Bureau under the following conditions: (1) They will be loaned or shown, preferably at meetings of miners, mine operators, mine inspectors, mining institutes, associations or similar gathering of persons concerned in the production, manufacture, or utilization of any of the minerals of the United States. They may, however, be loaned for general meetings other than those listed above, in which safety or prevention of waste in any industries are important factors. (2) They will not be loaned or shown at meetings of the general public excepting where the development of an interest in mining problems and in safety in the mining or metallurgical industries is an important factor. (3) In no case will these film and lantern slides be loaned or shown at public meetings where entrance charges are made. (4) They will be loaned preferably only on application of responsible persons concerned in the mining or metallurgical industries. Responsible persons engaged in other industries may borrow them when the purpose is to promote safety or prevent waste. (5) They will be loaned only providing the applicant guarantees that they will be shown by an experienced motion-picture or lantern slide operator, and providing further that he pays expressage both ways and guarantees or insures the safe return of the same, at an appraised value of $150 per reel of film, and 25c. per lantern slide. (6) On especial occasions, upon application, the Bureau may provide an engineer or other lecturer, and, on exceptional occasions, its own projecting machine and operator. The Bureau will be glad to receive suggestions to this effect. (7) Deviations from the above rules can be made only by authority of the Director of the Bureau of Mines.

Some Motion Pictures Available.

Mine Explosion and Rescue at the Lick Run Mine of the Pittsburgh Coal Co., Bruceton, Pa. Showing scene at mine, followed by an explosion; telegram is then received at the Bureau of Mines telling of disaster, and rescue car is immediately despatched; rescue men enter mine, bring out injured, and apply artificial respiration. *An American in the Making.*—Showing a European peasant receiving passage money to go to America: on arrival is met by his brother and taken to Gary, Ind.; is guided to Y.M.C.A. instead of saloons to spend his leasure hours; unfitted for skilled labour, is given employment as a labourer, and his first lesson is one of safety; he is shown goggles to protect the eyes from flying chips, a safety hook, a hand protector with safety-spring wrist band, a guard for gauge glass, a locking switch, and universal danger sign. Transferred to Lorain, Ohio, he learns of other safety appliances; for example, guards on drill press, guard on planer, guard on circular saw, chip guard on shaper for protection of eyes, guards on emery wheel, guard over belt and pulleys, and guards over feed gears of lathe. He returns to Gary and goes to work at open-hearth furnaces and converter. *National Mine Safety Demonstration, Pittsburgh, October 31, 1911, under Auspices of U.S. Bureau of Mines, American National Red Cross, and Pittsburgh Coal Operators' Association.* Showing President Taft arriving at the demonstration, immediately after which the first-aid competition commences. Details of the treatment of electric shock are shown, and details of rescue men wearing helmets also are shown. The President presses a button and causes explosion of coal dust in the experimental gallery, after which the rescue men enter the smoking gallery and bring out injured and apply first aid. The President and his party then go to speaker's stand, and following speeches by the President, Secretary Fisher, and Miss Boardman (of the American Red Cross), trophies are presented to all competing in the meet. *The Miner at Work at the Marianna Mine of the Pittsburgh-Buffalo Co.*—Showing miners descending into the mine, followed by view of the hoisting engineer at work; mine cars are distributed to the working places underground; mine foreman giving instructions in his underground office; miner is shown at his working place; loaded trip is made up and taken to the shaft bottom by compressed-air locomotives; loaded mine car sent to surface; miners are sent to the surface, where they leave their safety lamps in lamp room. *Demonstration of First Aid to Injured Miners.*—(1) An accident resulting in a dislocation of the shoulder, which is immediately reduced by injured miner's companion. (2) Miner injured underground is brought out by "one man carry," resuscitated by Sylvester method, and burns of abdomen dressed. (3) Trolley wire is displaced by careless miner and another falls on it and is shocked. Miners trained in first aid resuscitate by Schafer method and bandage burned hands. (4) Details of bandaging: (*a*) The eye: (*b*) the throat: (*c*) the forearm; (*d*) the elbow; (*e*) the arm and hand; (*f*) the upper arm; (*g*) the hand: (*h*) the top of the head, etc. *Demonstration of Inflammability of Coal Dust and Use of Rescue Apparatus at the Gas and Dust Gallery No. 1, Bureau of Mines Testing Station, Pittsburgh, Pa.* Showing explosion of coal dust by ignition of black blasting powder, followed by the entry of rescue men into the smoke gallery, returning with injured men, resuscitating them and applying first aid. *Transportation of Coal.* Trips of loaded mine cars come from mine portal, go to tipple, and are dumped. Next, coal is loaded into coal cars from tipple, several different methods being shown. A long train of coal cars *en route* to the dock is followed by scenes showing various methods of loading into the boats. After the voyage, the ship is unloaded. Coal is transported to distributing points and retailed. *Welfare Work in Mining and Allied Industries.* Showing various features of welfare and social improvement work which have been undertaken by various concerns, *e.g.*, swimming pools, playgrounds, hospitals, change and wash houses, etc. *Safe Method of Bituminous-coal Mining at the U.S. Coal and Coke Co. Mines, Gary, W. Va.* (2 reels). Showing assistant foreman testing for gas and inspecting roof, machine runner at work; miners loading coal; miners laying track; drilling for shooting; charging explosive; loading coal following shot; miners posting places; trip of loaded cars coming from mine; empties returned; dumping in tipples, loading coal into railroad cars; miners quitting work, leaving checks and returning home. *Joint Field Meet of U.S. Bureau of Mines and American Mine Safety Association, Pittsburgh, Pa., September, 1913.* Showing mine-rescue teams contesting for prizes; rescue of miner overcome by afterdamp and a miner who has erected a barricade to the afterdamp; explosion at the Experimental Mine of the Bureau of Mines; rescue crew of the Bureau of Mines motoring to scene, rescue men donning apparatus and entering mine. *Blast of 8½ Tons of Powder at Limestone Quarry of Bethlehem Steel Co., McFee, N.J. Results of Explosion Tests at Experimental Mine. Blast of 40 Tons of Powder at Quarries of Tompkins Cove Stone Co., Tompkins Cove, N.Y. Mining Magnetic Iron Ore at the Mine of Witherbee, Sherman Co., Mineville, N.Y.; Safe Method*

Shows the details of mining iron ore, including drilling, blasting, hauling, hoisting, timbering, and the details of separating and shipping the ore; the arrangement of the plant and town, and details of power plant. The whole picture is arranged with a view to emphasising and promoting safety. *The Fly Pest.*—Laying eggs in outside meat: the eggs attacked by Ichneumon fly: the hatching of the eggs: maggots one hour old: maggots seven days old: entering earth to become pupa: the pupa stage one day later: the fly emerging wingless from the earth: eleventh day, the fly full grown: fly taking syrup from a needle point: fly's tongue: foot of a fly: how flies carry contagion: how the fly spreads tuberculosis. *War on the Mosquito.*—Examination of the pool to find if larvæ are breeding; mosquito eggs hatching in the water; mosquito larvæ—they breathe through their tails; mosquito in intermediate or pupa stage; they breathe through their horns; mature mosquito emerging from pupa; treatment of the pool with oil the oil prevents the mosquito larvæ from breathing: cleaning out a typical breeding place before filling with dirt; treatment of another place with oil: tin cans holding stagnant water barred: mosquitoes by the millions: health officer teaching school children to aid him in his work: larvæ water beetle devouring larvæ of mosquitoes: mosquito biting a man's hand notice the body filling with blood.

WAR AND THE RE-PARTITION OF AFRICA.

The Economic View—Envisaging "The Big Thing"—"In Time of War, Prepare for Peace."

[*Contributed.*]

It must be obvious to all that the day will come when, in the settlement of nations following upon the most devastating of wars the world has ever seen, or is likely ever to see again, the question will be asked of us, what do you want, what do you ask for, what will satisfy your national ambitions, what, before all things, will bring you peace, progress and prosperity? What will make of you a great Nation, worthy of a great National aspiration, a great unit in the great brotherhood of nations of the Empire? Something that will make for peace, for political rest, for the settlement of racial troubles, the building up and binding together of a great people, a crystallisation under God of all that is best. A settlement, too, of the native question, which looms ever greater and greater as time speeds on, a factor which we all admit some day or other will have to be met. Is it not the time for thought? for certain it is that ere long the readjustment of Africa is one of the questions, and almost the most important one, which will have to be dealt with in the Chancelleries of the World, in the discussions and arbitratments of a World's peace.

THE PRESENT THE TIME FOR THOUGHT.

There will be no time to think when "the day comes" —this and now is the time for thought—what do you want, what do you ask for? Make no two bites at a cherry. The United States of Africa under the protection of the British Flag. That protection is to-day more eminently necessary than it has ever been in the past. Wipe out the German peril and you remain a family of friends, a brotherhood which needs the protection of a fond mother who asks how much in return other than filial love? Only the right to protect the weak in the polity of nations. Having dealt with German West (it was our right before, and it is our right now), that it should come to us; the Bechuanaland Protectorate would naturally be given to us, given we play the game; Rhodesia, willing and anxious to come in with us to-day by amalgamation with proper representation and no absorption, and that takes us north of parallel 10, to Lake Tanganyika, and so we are moving again back to the great idea of the greatest man South Africa has ever produced the Cape to Cairo idea. It may be early to go so far afield, but the time may be considered ripe when we can get anyhow nearer to it, a time when we may at least secure a way leave should circumstances at any time favour further extension. In the meantime look at the map of Africa and consider the equatorial line. Is there any reason why we should not connect up with the Soudan, on or about the equatorial line, inviting our Portuguese Allies to come in with us, asking our Belgian Allies also to come in and help us? That means Portuguese East, Portuguese West and the Belgian Congo, and from the Mother Country we would ask for British East Africa and Uganda, thus connecting up with Lower Egypt. Is the thing too visionary?

THE "BIG THING."

Is the thing too vast to be thought of? I think not. We have had our opportunities before, and we lost them; here is our chance again. Do not let us cast it aside as a thing not to be considered. Where else in the world could you find opportunity for the making of a nation such as lies here at our hands to-day? Every idea of racialism can be swallowed up in the magnificence of our destiny if we can only be men and grasp what the gods are offering us. Your native question, always a bugbear, would settle itself, and quickly under a United Africa, and you find at once an outlet for the enterprise of your young growing people, a difficulty which is ever before those who can think at all as to the future of those we are responsible to for their creation—the future of our boys and girls—the making of a great people. Say that there are difficulties. Yes, let that be allowed, but there are none that are not surmountable, none that cannot be overcome. Those of representation and the like, to be settled easily on practical bases. Measures of finance, of responsibilities, all are easy when the moment comes, with all hands to the wheel, recognising that for all time we must look in Africa for the protection of our sea board, every foot of it, to those who to-day are responsible for our very existence. The moment is ripe for us to open our arms to those of our allies, especially in Africa, who will work with us for the permanent settlement of this vast Continent, for its peace and prosperity. We have spent, and are spending, our blood for France, we are spending our blood for Belgium, and we have ever stood by Portugal. We are, and have ever been, a support of the weaker as against every sign of tyranny and cruelty. Let the suffering of to-day be for the purification of to-morrow. Advance Africa!

Natal Navigation Collieries.

The report of the Natal Navigation Collieries and Estate Company, Ltd., for the year ended 30th June, 1914, states that, notwithstanding a decrease in the output of 6,029 tons, the net financial position has improved, though capital expenditure has been increased from £9,879 last year to £10,313 this year. The reduction in output was due to the strike of indentured Indian labourers in October November, 1913, and the strike of white miners during the greater part of January. During the second half of the financial year from about the end of January last there has been a substantial increase in the cost of white labour. The net profit on coal, coke, and sundry revenue was £45,602, as against £42,776 from last year's larger output. The cost of options and drilling that did not disclose coal of commercial value, amounting to £1,933, has been written off, the balance standing to credit of development account pit 3—namely, £2,290—has also been written off. The more favourable satisfactory results have been due to the increased average price at which coal has been sold, compared with the price during the previous twelve months. Interest on fixed deposits had been increased from £4,618 to £4,972. The amount of £13,396 debited against profit and loss account for depreciation brings the total written off for the last seven years to £85,398. The book value of the assets (excluding property accounts) is thus brought down to £85,356 for the three pits.

PERSISTENCE OF ORE IN DEPTH.

Mr. T. A. Rickard Replies to the Critics—"The Death of a Fallacy."

In replying to the discussion on his paper before the I. of M. and M., Mr. T. A. Rickard said: Mr. President and gentlemen, I appreciate the introductory remarks of the President. There is no doubt that the title of the paper might have been "The Impoverishment of Ore in Depth," or perhaps even better, it being presented to the Institution of Mining and Metallurgy, "The Continuity of Mining in Depth," because, after all, I consider ore as the objective of mining. I do not consider it from the point of view of the mineralogist or the chemist; I consider it wholly from the economic point of view, and I have said so again and again. May I express our general thanks to Mr. Marriott for showing us that longtitudinal section, and giving us so much interesting information. I hope that my action in eliciting that information will not be considered an undue trespass on his courtesy. I do not care to argue with him on the matter. He was kind enough to let me see that diagram, but, as I said at the last meeting, I nevertheless came to a contrary conclusion. I am sorry Mr. Marriott is not here, but I have only this to say in addition, that the red that you saw on that map indicated a given grade of ore. He did not wish to state, and, although I know it, I shall not state, what it was. That section does not indicate ore richer than a figure considerably below the average of the richest mine; it only indicates variation from that point down. Of course, for the purpose of this argument we want the qualitative record up as well as down. Permit me to thank you for the kindly manner in which you have received my effort to throw light upon an obscure problem. I desire more particularly to express appreciation for the contributions to the discussion. The greatest compliment that can come to an author is thoughtful criticism. I shall endeavour to return the compliment in kind. Huxley said: "Spencer's idea of a tragedy is a deduction killed by a fact." Gentlemen, you may not be aware of it, but you have been present at the obsequies of a pathetic fallacy. The *coup de grace* was a sabre thrust of Irish wit delivered by one of our most honoured members. We have reached the point where we recognise the beneficience of Providence in placing the better parts of ore deposits within easy reach of man. Several members have demurred to the definition of ore given in my paper. My honourable friends. Messrs. McCarthy and Trewartha-James, have expressed a not surprising preference for their own definitions. But, I submit to you, it was necessary for me to define the meaning within which I proposed to discuss the question of persistence. In regard either to metalliferous substances attractive to the miner or to elements required for the world's use (I do not quote my critics verbatim), I can only say that the persistence of such material does not interest me: that involves a problem much too academic. Mineral aggregates that are attractive or that contain useful elements are likely to persist to a depth far beyond the operations of such eminently practical engineers as the two members mentioned. Frankly, I had to state my case before we could begin this discussion, and my case concerned only the limited portion of mineral deposits that can be exploited to economic advantage. Economic advantage usually entails pecuniary profit, but not always: Governments may find it necessary, as in Hungary, to operate mines in order to find employment for their people: a manager may find it advantageous to break poor stuff, and, having broken it, to treat it as ore, so as to reach better ground. This not infrequently is the case in alluvial mining. But the exceptions only emphasise the rule, which is that the miner's ultimate purpose is to make money by the exploitation of such mineral aggregates as yield more than the total cost of the necessary operations. While objection is made to my limitation to the meaning of "ore," it is suggested that I have failed to give a sufficient limitation to "depth." Here again, it was a part of my case that "depth" cannot be stated in feet, simply because the lower limit of every orebody has not yet been reached. Prophecy is the test of a scientific theory, it is true; but I offer no theory: all that I have done is to collect facts and to sift them with a view to proving that the idea of general persistence is a false generalisation. Bossuet said that the greatest aberration of the mind consists in believeing a thing because it is desirable. That is what the operators of mines have done, while engineers have stood aside in polite acquiescence. "Depth" is a relative term: when it ceases to be so, as it will in the future, we shall be able to replace it by a measurement in feet. Meanwhile, I accept such an example as the Ivanhoe mine at Kalgoorlie, and say that while Dr. Maclaren may have ascertained that a particular intrusive rock is favourable to the enrichment of the Great Boulder lodes, my view is that the congenial character of the rock is likely to prove a less decisive factor as further depth is attained. To put it plainly, the lode is more likely to be productive when traversing this particular rock at 1,000 feet from the present surface than when traversing the same rock at 4,000 feet. The factor of depth, in a relative sense, has entered the problem.

The reference to the Flat lode in Cornwall is useful. According to Mr. Trewartha-James this lode was poor down to about 900 ft. in depth: it was rich from 900 to 1,500 ft.; and now at 2,000 ft. it shows "diminished productivity." I beg to demur to the statement that this is "a good sound instance of remarkable enrichment in depth." When a mine has gone down to 2,000 ft., its workings between 900 and 1,500 ft. cease to be "deep." Using depth in the sense postulated in my paper, the ore in this lode has given signs of impoverishment in depth. The Britannia, I presume, is an example of secondary copper enrichment, and it was probably the recognition—this is a mere conjecture—of the possibility of such enrichment, which is not related to great depth, that led to the successful development described by Mr. Trewartha-James. The limited number of mines worked to "any appreciable depth," as depth is considered to-day—that is, to 4,000 or 5,000 ft. vertically—should, it is true, render us cautious in coming to a definite conclusion, as Mr. McCarthy suggests; but I submit that the particular conclusion to which we should not come hurriedly is that mines generally can be exploited advantageously to such a depth as the greatest yet attained. We are, it seems to me, justified by the small number of survivors in concluding that the survival is unusual. In an exceptionally rich mineral region, like Colorado for example, only one location in 500 warrants patenting, and I venture to say that out of 100 prospects strong enough to justify the expense of patenting only one becomes a mine of pronounced vitality, that is, productive to, say, over 1,000 ft. in depth. That means that one out of 50,000 claims covers an ore-body relatively persistent. It is true, as Mr. McCarthy says, that thirty years ago the probability of the Mysore or the St. John del Rey mines going down to their present depth was slight; nevertheless, was it not a fact that such probability was imputed not only to them but to a thousand others now abandoned and forgotten? Of course, in attempting to destroy a generalisation, it appears as if a counter-generalisation were being formulated. However, the denial of an old one need not require the affirmation of a new one. That you will, I trust, grant, even if my argument may seem to have led me from one extreme to the other. An indication of non-persistence is afforded by the discontinuity of outcrops, as is suggested by Mr. McCarthy and by Mr. Terrell. Yes, the best proof of indefinite persistence would be a circumterranean outcrop. Failing anything of the kind, we may well pause to consider how discontinuous are the superficial exposures of ore along the strike of a lode. Any attempt, however, to establish a ratio between length along the strike and depth along the dip is extremely hazardous. The depth of a crack may be in direct ratio to its length in a homogeneous rock, but ore-bodies in their extent are not limited merely by the fissures or sheer-zones they occupy, but by the penetrative power of chemical solutions and other factors of a complex character. The Main Reef series of the Witwatersrand may be mined continuously for fifty-five miles, but any inference therefrom that the banket can be exploited profitably to a depth, say, one-fifth of the length, is rendered ridiculous by the facts already available from workings barely one-tenth of the depth suggested. It is true that the Rand engineers claim, as Mr. Olver has done in this discussion, that the ore deposits of the Rand are *hors concours*, and must not be judged by observation elsewhere. That, I can say from wide travel, has been the mental attitude of intelligent persons in many other celebrated mining districts. It is an attitude stultified by experience.

Professor Frecheville thinks that I have given a one-sided view. That is fair comment. I think it is likely that I have. I was combating one interpretation of the problem and naturally inclined to its opposite. As regards my failure to offset the Village Deep with the City Deep, that was not done by inadvertence. The Professor may have information not accessible to me, but the information received by me from Johannesburg includes the following data:

Level.	Depth.	Average Assay. Dwt.	Average Width. In.	Inch Dwt.
No. 2	2137	44.9	21.6	970
No. 6	2725	13.8	30.6	422
No. 10	3360	11.2	35.8	401

The outcrop mines above the City Deep are the Meyer and Charlton, Wolhuter, and New Goch, in order eastward. It appears to me that a comparison between the richness of the City Deep workings and those of the three mines mentioned does not warrant the idea that there has been an enrichment in depth. If it can be proved, it were well to do so. As regards the Champion Reef mine, the longitudinal section of the stopes is quantitative, not qualitative. According to my argument, an improvement in the richness of the vein at 1,000 ft. is not so likely as a similar improvement at 2,000 ft. in depth. My reason for thinking so is that experience indicates that a mine's chances of recovery decrease with depth, as, by analogy, a man's chance of recovery from serious illness becomes less as he grows older. In regard to the North Star, the production per square foot has increased, but this is due in part, as stated by me, to better metallurgical treatment. The statement that "the miner has never failed yet to bottom any ore deposit he has found" is true, because the few ore bodies still persisting to great depth have not been abandoned by the miner, and every reason exists for believing that he will work them to their lowest limit. Professor Frecheville misunderstood me, that is all. Mr Turner and Dr. Cullis note that I have made no reference to deposits of magmatic origin. Theoretically it may be granted that the mode of origin of such deposits does suggest a persistence deeper than that of most other types of mineral aggregate. Yet the information available concerning contact deposits, as elucidated by Professor Kemp, for example, is significant. However, I am not discussing the persistence of mineral masses of magmatic or of pneumatolytic origin: I am discussing the persistence of those relatively restricted portions of them that have been concentrated by thermal solutions, more particularly the small number that have commercial value and come under the definition of "ore" postulated in my paper. As I listened to the clear exposition of the Professor of Economic Mineralogy I felt almost persuaded that he had placed his index finger on a type of ore deposit that belonged to the super-Methuselah class, but, on passing from under the spell of his scholarly speech, I remembered that no orebody of known magmatic origin had as yet been traced to the barysphere, and that he was dealing with gay potentialities, not grim actualities. When you define "ore" in terms of economics, you clip the wings of the geologist's constructive imagination. The decreasing width of the banket beds of the Rand is an interesting point brought forward by Mr. Horwood. Having regard to his intimate knowledge of the Main Reef series, I may be permitted to express sympathy with Mr. Horwood in his courageous insistence that the Rand is a unique goldfield: but I demur to his argument that the past production, or even the continued productivity, of the Rand, as stated by him in general terms, is evidence on the point at issue. The fact that the Rand may, and I hope will, yield at least as large a total output of gold in the future as it has in the past does not throw direct light on the problem as to whether the banket lodes are richer or poorer in gold with increasing depth. The low-grade productivity of a mine usually lasts longer than its bonanza period, and often yields more metal, but at less profit. I do not care to press my contention in which I am supported by several engineers of the highest reputation—that the banket lodes give signs of impoverishment with depth: in this disputation I can claim, like the armies of the Allies, that General Time is on my side. [illegible] To Mr. Mennell I proffer sincere condolence on the spoiling of his frank and outspoken utterance by transcription from the first to the third person. The sort of plain speaking in which he most properly indulged receives no literary justice by being recorded in the conventional phrasing of a skilful reporter. Scientific evidence ought to be given with the egotism of a witness. However, I have a delightful recollection of Mr. Mennell's delivery of his opinions, based upon wide and penetrating observation, and I am grateful to him for enriching the discussion by a contribution so much to the point. Certainly, as Mr. Mennell suggests, the great mines considered in detail in my paper represent notable exceptions: it would have been cruel to record the unhappy stories of the much larger number that would have proved my contention overwhelmingly.

Incidentally, I may say I have not mentioned railway tunnels, and yet most of you know that some of the most productive mineral regions have been penetrated at depth by tunnels, in the Alps, the Rocky Mountains, the Andes, and so forth, and among the rare cases of the discovery of ore in railway construction I can only recall one at Cobalt and another at Copper Rock, in Colorado. I ask you to recognise that my treatment of the subject, at least as regards notable illustrations, has been kindly, not corrosive. But before I close these remarks I shall trespass on your geographical knowledge, on that geographical knowledge that in its exuberance has been able to imagine the transfer of Russian troops from the White Sea to France by way of Scotland, and has conceived the transport of Japanese reinforcements from Yokohama to Warsaw: I shall ask you to go with me in retrospective imagination to famous points of vantage from which whole mining districts can be seen almost at a glance. Come with me, then, to Dolliver mountain, in Nova Scotia, and to Red mountain, in British Columbia: linger a few minutes on Carbonate hill, Leadville, or Bull hill, Cripple Creek. Proceed thence to Columbia mountain, commanding a view of Goldfield, or Mount Davidson, overlooking the mines of the Comstock lode; go southward to the top of the Sierra de Santa Rosa, or linger on the Cerro de Proano, both in Mexico; continue southward until you can look at the old mines at the feet of the Cerro di Potosi, or those visible from the Cima de Chorolque: cross the seas to the famous Victoria hill, at Bendigo, or Bunninyong, near Ballarat; turn homeward and pause on the Sneeberg or the Rammelsberg; alight on the Pûy-de Dome or the Challanche; and then end your circumspection by resting on the top of Carn Brea or Carn Marth; look carefully at the gaunt engine-houses that punctuate the landscape like a big cemetery of bygone industrial life! I ask you to consider what it all means, and then I turn and say to you: *Si argumentum requiris, circumspice.*

(*To be continued.*)

MINING MEN AND MATTERS.

"Eckstein's have again supported the Witwatersrand Agricultural Society most liberally, their donation this year being £2,000 towards the building fund," says the *Leader*. Surely the gift should be credited to the Central Mining–Rand Mines group, which has replaced the Ecksteins familiar to a former generation.

* * * *

A new and enlarged edition of "Who's Who in Mining" is in preparation. Past editions of the work have served a useful purpose, and promise to go on improving. The editor, Mr. George Safford, asks us to say that he will welcome from engineers in all lands, sketches of their lives that he may use in preparing the new volume. He may be addressed at 18, Eldon Street, London, E.C., England.

* * * *

The twentieth annual general meeting of members of the Association of Mine Managers of the Transvaal (incorporated) will be held in the Council Chamber, Chamber of Mines, Johannesburg, on Friday, 19th February, 1915, at 3 p.m. Business: (1) To read and confirm the minutes of the nineteenth annual general meeting held on the 20th February, 1914; (2) to receive and consider the report of the Council on the state of the Association, together with the annual statement of accounts; (3) to elect a President, Vice-President, and eleven Members of Council for the ensuing year.

* * * *

The numerous friends of Mr. Alexander Heymann, the brother of the analyst, Dr. Heymann, will be glad to hear that news has recently been received from him. He was missing for some time after the opening phases of the war, but he is now among the "interned" in Berlin. Mr. Alexander Heymann is doubly repugnant to our German enemy, inasmuch as he is Russian born and took out British naturalisation papers some years back. His numerous friends along the Reef will be pleased to hear of his safety. From information received the general view in Berlin is that the Kaiser and his precious son have over-reached themselves and that the general populace are anxious for peace at any price.

City and Suburban.

In January the City and Suburban crushed 29,500 tons, recovering 12,880 fine ozs at a profit of £22,230.

CORRESPONDENCE AND DISCUSSION.

Tanning Materials.

To the Editor, *South African Mining Journal.*

Sir,—The note on page 446 with reference to the materials desired for tanning of leather should be of interest to every owner of land now lying waste. I take this opportunity of again calling attention to the enormous value of the easily-grown tree, Quebracho Colorado. This tree forms the basis of a large tanning extract business in S. America. The timber, the roots, the branches, the leaves, the sawdust, are all utilised at great profit to the growers. Perhaps African Farms or Consolidated Lands, or some of the land companies would look into a well-established industry. No theory, but solid profit! You could do no better service to the State than promulgating a "Wake up, Africa" policy in agriculture and industries. The constant dropping of water will wear away a stone, and the repeated truth will, without doubt, wear away the encrusted apathy of our mandarins and pseudo-leaders. The best method to establish forests of Quebracho Colorado would be to get the fullest information personally, and not to rely on second-hand evidence. The value of Q.C. to this country is greater than gold.—Yours, etc.,

"K. A."

ANSWERS TO CORRESPONDENTS.

"Puzzled."—According to the "Stock Exchange Year Book," the East Rand Amalgamated Gold Estates in December, 1910, declared a dividend of 15 per cent. in shares of the Bukit-Sympa Rubber Co., as to 3 per cent. in preference shares and 12 per cent. in ordinary shares. No distribution has since been made. The reference continues: "No report has yet been received, but this information is official." There is no market in the shares, and it is extremely doubtful whether you could dispose of them.

"Arduous" (Mafeking).—(1) Certainly hold on; they cannot fail to go better. (2) In about two years.

The best "Reef Traveller" is the *South African Mining Journal*.

Rhodesian Section.

LATEST MINING NEWS.

Rhodesian Finances—Falcon Mines—Shamva—Rezende Mines—Rhodesian Producers.

The last issue of the Rhodesian *Government Gazette* contains unaudited statements of revenue and expenditure for the nine months ended December 31st last. The position disclosed is as follows:—Expenditure, £617,694; revenue, £577,886. There is, therefore, a deficit of just on £40,000 for the nine months. The Treasurer, in his Budget Statement, estimated a shortfall of £70,000 for the full year, so that, taking the figures as they stand, the position is not unsatisfactory. The revenue, it is true, falls short of the average of the Budget estimate by a fairly considerable amount. Providing the same rate is maintained, the receipts at the end of the year would be over £50,000 less than was expected, but a considerable amount of the revenue from licences will fall to be received in the remaining three months of the year. For the nine months the stamps and licences collections only amounted to £31,000, whereas the full year's estimate was £80,000. Apart from transfer duty, which has so far produced only £6,600 out of an estimate of £17,000 for the year, the other receipts are not so discouraging as the times might lead one to expect. The Customs and Excise duties collected in the nine months amounted to £181,000, as compared with an estimate for the year of £283,000, which would bring them out at about £40,000 below the estimate if the same rate is maintained for the rest of the year. Postal revenue shows the most serious falling-off, the receipts being just under £34,000, whereas the year's estimate was £54,000, and on the same proportion there will be a fall of about £10,000 for the year. Telegraph revenue, on the other hand, is almost up to the Budget average. Turning to the expenditure one finds continued signs of a very tight hand being kept on the purse-strings. If the same rate of expenditure is maintained until the end of the financial year, the total will fall short of the estimate by some £70,000. It is, however, obviously unsafe to take these figures for the nine months as an indication of what the position will be at the end of the year, and one can only state the position as it is revealed at December 31st last.

* * * *

A complaint of abnormal rains comes from the Falcon Mines. The message is not clear, so that one is left in doubt as to whether the December reduction operations were seriously affected, or whether those for January are being checked. As an increased quantity of ore was crushed in December, it may be that the interference is with January working. Here are the figures from September inclusive:—

	Tons.	Copper. Long Tons.	Gold. Ozs.	Estimated Value.
September ...	8,117	154	2,171	£17,420
October	8,506	261	3,821	30,933
November ...	11,408	232	3,335	27,230
December ...	12,608	193	2,826	22,881

Unless in some manner the rains can have affected the extraction processes a grade of ore much inferior to the average of the reserves was treated in December. There has been so much controversy as to the value of the Falcon mine that shareholders will await with some interest the results of the January working.

* * * *

Two features stand out from the December output of the Shamva. The ore crushed increased 8,670 tons, and again exceeded the 50,000-ton mark. Doubtless this helped considerably in attaining the remarkably low working cost of 6s. 10d. per ton, which is 1s. 2d. less than in November and 1s. 8d. less than Mr. Piper's original estimate some years ago, thought at the time to err on the side of optimism. To some extent these favourable factors were nullified by a further fall in the yield of 1s. 4d. per ton, to 11s. 7d.

* * * *

The results of operations at the Rezende Mines for the month of January, 1915, are as follows: Estimated profit: Central Section, £2,526; Old West Workings, £303; total, £2,829.

* * * *

With regard to the older Rhodesian producers, the following returns of production will be of interest:—

	1913.	1914.
Bushtick	£57,797	£45,921
Fred	32,950	60,253
Lonely	219,134	187,924
Queen's	47,292	39,399
Nelly	23,148	25,939
Old Nic	43,749	44,764
Csardas	28,865	32,506
Gaika	66,297	88,794
Globe and Phœnix ...	516,116	465,686
Wanderer	73,862	75,921
Brilliant	25,222	26,536
Eigel Blue	32,527	33,201
Giant	139,476	67,018
Owl	31,891	17,115
Thistle Etna	58,131	44,673
Eldorado	185,231	128,540
Jumbo	54,441	40,624
Rezende	131,979	126,064

The following is a brief summary of the gold output for 1914 of the different districts, the feature of which is the fact that the Gwelo district alone has produced during 1914 over a million sterling—or practically the same amount as the gross production by the country only ten short years ago:—

	1913.	1914.
Bulawayo	£780,928	845,565
Gwelo	901,578	1,005,230
Hartley	638,794	772,095
Lomagundi	200,876	173,858
Mazoe	134,603	172,827
Salisbury	32,663	362,245
Umtali	198,989	206,148
Victoria	11,837	42,841

Sheba G.M. Co.

The following are the results of operations of this mine for the month of January, 1915: Crushings for the month, 7,000 tons, yielding 2,812 ozs.; estimated profit, £3,233.

MINING INSTITUTE.
TEACHING CENTRES:—{ JOHANNESBURG AND SCHOOL OF MINES, KIMBERLEY.

Prof. YATES prepares candidates for the following Government Certificates:—
MINE MANAGER'S. MECHANICAL ENGINEER'S.
MINE OVERSEER'S. ELECTRICAL ENGINEER'S.
MINE SURVEYOR'S
by Class Private Tuition, and Correspondence.
SOME 1914 RESULTS:—
MANAGERS - - - January and May - - ALL Passed.
ELEC. ENGINEERS - February - - - 66% ,,
MECH. ENGINEERS - June (Kimberley Centre) - - ALL ,,
MINE OVERSEERS - - - - - Practically ALL ,,
NEARLY 200 SUCCESSES. St. James' Mansions, Eloff Street.

THE JANUARY GOLD OUTPUT IN DETAIL.

Total of 714,984 Ozs., Value £3,037,058—A New Producer—Improved Native Labour Figures.

The gold output was declared on Wednesday at 714,984 ozs., valued at £3,037,058. For the previous month the figures were 695,137 ozs., value £2,952,755. In November they were 715,836 ozs., value £3,040,677. The drop in December was due to the stopping of the mills on Christmas Day. January was a full month of 31 working days. The details of the output for last month, with the comparisons for December, are:—

	Ounces.	Value.
Witwatersrand	699,817	£2,930,156
Increase	20,742	88,108
Outside districts	25,167	106,902
Decrease	895	3,805
Total output	714,984	3,037,058
Increase	19,847	84,303
Total stamps		9,671
Decrease		136

The record was reached in March, 1913, with a total of £3,373,998. Certain mines suffered both from the drought and the subsequent floods. The native labour returns show that on the last day of January the number of natives in the service of the Witwatersrand Native Labour Association and contractors on gold mines was 172,331, compared with 164,650 in December. The last highest total was in October, 1914, when 170,438 were on the roll. Last month, too, saw the entrance of the Modderfontein Deep Levels, Ltd., into the output returns.

INDIVIDUAL RETURNS

	Ounces.	Value.
Aurora West	4,207	£17,870
Bantjes Consolidated	2,837	12,051
Barrett	187	794
Brakpan Mines	18,478	78,490
City and Suburban	12,880	54,711
City Deep	20,914	88,837
Consolidated Langlaagte .	15,717	66.762
Consolidated Main Reef ..	8,637	36,688
Crown Mines	54,039	229,543
Durban Roodepoort Deep .	8,229	34,955
Durban Roodepoort .	3,559	15,118
East Rand Proprietary .	50,138	212,973
Government G.M. Areas ...	10,615	45,090
Fairview T.C.L.	649	2,757
Ferreira Deep	23,411	99,444
Geduld Proprietary	8,486	36,046
Geldenhuis Deep	15,334	65,135
Ginsberg	3,936	16,719
Glencairn	3,612	15,343
Knight Central	6,769	28,753
Knights Deep	16,505	70.109
Langlaagte Estate	13,836	58,772
Luipaardsvlei Estate .. .	3,732	15,853
Main Reef West	6,075	25,805
May Consolidated	2,334	9,914
Meyer and Charlton	7,948	33,761
Modder B.	19,070	81,004
Modder Deep .. .	8,105	34,428
New Goch	7,150	30,371
New Heriot	5,702	24,221
New Kleinfontein	16,007	67,993
New Modderfontein	24,449	103,853
New Primrose	5,092	21,630
New Rietfontein	1,806	7,761
New Unified	3,268	13,882
Nigel	5,304	22,530
Nourse Mines	15,102	64,149
Princess Estate	6,783	28,812
Randfontein Central	55,145	234,241
Robinson G.M.	19,735	83,829
Robinson Deep	17,706	75,210
Roodepoort United	7,260	30,838
Rose Deep	16,849	71,570
Rietfontein (T.C.L.)	226	960
Simmer and Jack	17,354	73,715
Simmer Deep	12,996	55,204
Spes Bona Tribute	750	3,186
Van Ryn Deep	18,399	78.154
Van Ryn G.M.E.	11,878	50,455
Village Main Reef	11,696	49,681
Village Deep	16,200	68,813
Vogelstruis Estates	3,151	13,385
West Rand Central	764	3,245
West Rand Consolidated . .	8,247	35,031
Witwatersrand G.M.	12,788	54,320
Witwatersrand Deep .	12,859	54,621
Wolhuter G.M.	9,182	39,003
Sub Nigel	2,055	8,729
Sheba	2,812	11.945
Worcester Exploration .	883	3.751
Quest	648	2,753
Ceylon Lydenburg ...	120	510
Glynn's Lydenburg	1,277	5,424
Transvaal G.M.E.	6,020	25,571

TWELVE LEADING COMPANIES.

The twelve leading companies for January, in their order of precedence, are:—

	Ounces.	Value.
Randfontein Central	55,145	£234,241
Crown Mines	54,039	229,543
New Modderfontein	24,449	103,853
Ferreira Deep	23,411	99,444
City Deep	20,914	88,837
Robinson G.M.	19,735	83,829
Modder B.	19,070	81,004
Brakpan Mines	18,478	78,490
Van Ryn Deep	18,399	78,154
Robinson Deep	17,706	75,210
Simmer and Jack	17,354	73,715
Knights Deep	16,505	70,109

FOURTEEN YEARS' RETURNS.

The yearly goldproduction of the Transvaal for the last fourteen years is shown in the following table:—

	Ozs.	£
1901	238,994	1,104,687
1902	1,707,661	7,253,665
1903	2,955,749	12,589,248
1904	3,779,621	16,054,809
1905	4,897,221	20,802,074
1906	5,786,617	24,579,987
1907	6,451,384	27,403,738
1908	7,052,617	29,957,610
1909	7,280,545	30,925,788
1910	7,533,843	32,001,735
1911	8,237,723	34,991,620
1912	9,124,299	38,757,560
1913	8,794,860	37,358,040
1914	8,378,139	35,588,075

GROUP PROFITS.

The following is a list of the profits returned for November, December, and January:—

	November.	December.	January.
Central Mining	£234,094	£222,571	£224,922
Rand Mines	193,553	148,615	156,782
Gold Fields	89,498	86,809	75,400
Robinson	86,350	82,473	74,145
East Rand Prop. . .	70,004	62,501	63,004
Kleinfontein	22,163	23,737	23,170
Barnato	111,210	120,237	126,738
Albu	65,535	65,046	62,403
Neumann	51,928	50,190	48,535
Goerz	12,309	11,159	19,885

Rand Mines Group.

The following are the results of crushing operations of subsidiary companies for the month of January:—

Company	No. of Stamps Running.	Tube Mills.	Tons crushed.	Estimated Working Costs per Ton.	Total Fine Ozs.	Total Estimated Profit.
Rose Deep ...	300	7	56,400	17/11·5	16,849	£19,905
Geldenhuis Deep	300	7	50,200	21/10·9	15,334	9,220
Nourse Mines ..	260	7	51,600	20/ 9·1	15,102	9,697
Ferreira Deep .	280	7	57,820	17/10·9	23,411	45,955
Crown Mines ...	660	26	191,000	16/ 4·4	54,039	70,072
Durban Rood. D	100	3	27,000	23/ 5·4	8,229	2,804
Totals & averages	1900	57	434,020	18/ 4·6	132,964	£157,653

Crown Mines, Ltd.—The grade continues below what is called for by the estimated value of the ore reserves which are being mined. The cause of this difference is being carefully investigated. The supply of native labourers is rapidly improving. There was an increase of over 1,100 in the number of Kaffirs employed by the company during the month of January, and it is confidently anticipated that this will lead to a substantial increase in the tonnage treated in the course of the next few months.

The following are the results of crushing operations of Central Mining companies for the month of January:—

Company.	No. of Stamps Running.	Tube Mills.	Tons crushed.	Estimated Working Costs per Ton.	Total Fine Ozs.	Total Estimated Profit.
Modder B. ...	120*	5	42,000	15/ 5·4	19,070	£47,420
New Modder. .	180	7	50,600	15/10·1	24,449	62,317
City Deep ...	150	9	46,800	21/ 4·3	20,914	37,348
Village Deep ...	180	7	48,800	18/10·7	16,200	21,748
Village Main R.	160	4	31,300	17/ 4·5	11,696	21,797
Robinson	250	6	60,100	13/ 3·5	19,735	42,577
Bantjes Cons. ..	100	3	11,050	33/ 4·1	2,837	†6,556
Totals & averages	1140	41	114,392	17/ 5·9	114,901	£226,651

†Loss.

* The stamps at the Modderfontein B. Gold Mines, Ltd., are 80 Californian stamps and 16 Nissen stamps; the latter are equivalent to about 40 Californian, making a total equivalent of 120 Californian stamps.

Bantjes Consolidated Mines, Ltd.—Loss of £6,556 due to central shaft breakdown, previously reported. Repairs progressing satisfactorily, and hope repairs to two hoisting compartments will be completed during the month of February, but loss should be anticipated for that month.

Goerz Group.

Results of operations of the crushing mines comprising the Goerz group for the month of January:—

Company	Stamps.	Tube Mills.	Tons Crushed.	Total Value of Output.	Total Profit.
May Consolidated ...	100	—	14,400	£9,892	£847
Modder Deep Levels...	60	6	25,750	34,345	8,030
*Princess Estate	60	5	22,000	28,742	—
†Geduld Proprietary ..	60	5	22,780	36,463	11,008
	280	16	84,930	£109,442	£19,885

*The Princess Estate shows a loss of £1,145 for the month, due to increased pumping and native labour expenses, the latter caused by exceptional influx of natives.

†In the case of the Geduld Proprietary Mines the reserve of gold at the end of January stands at 5,205 ounces.

Neumann Group.

The following are particulars of the results achieved by the crushing companies of this group during last month, viz.:—

	TONS.	YIELD.	PROFIT.
Witwatersrand Deep ...	41,626	£53,139	£18,100
Wolhuter	31,900	38,224	11,009
Consolidated Main Reef...	23,010	35,955	11,180
Main Reef West	21,990	25,289	4,223
Knight Central	27,100	28,234	4,023
Total for group ...		£180,841	£48,535

Barnato Group.

The results of operations of the Barnato group for January are as follows:—

Mine.	Stamps.	Tons Crushed.	Revenue from Gold.
Consolidated Langlaagte ..	90	50,600	£66,762
Ginsberg	75	30,087	16,719
Glencairn Main Reef ...	160	20,550	15,342
Government G.M. Areas...	90	44,200	45,091
New Primrose	140	20,400	21,630
New Rietfontein	65	7,884	7,670
New Unified	60	13,570	13,880
Quest	35	3,090	2,753
Van Ryn Deep	80	41,890	78,155
Witwatersrand	210	38,700	54,319
January totals ...	1,005	270,971	£322,321
December totals ...	1,020	257,593	£314,988

Mine.	Total Working Costs.	Working Costs per Ton Milled.	Gross Profit including Sundry Revenue.
Consolidated Langlaagte ..	£35,738	14·126	£31,411
Ginsberg	13,302	17·814	3,540
Glencairn Main Reef ...	12,733	12·392	2,808
Government G.M. Areas...	40,203	18·191	5,204
New Primrose	14,348	14·067	7,503
New Rietfontein	7,646	19·397	232
New Unified	8,802	12·972	5,156
Quest	2,541	16·447	261
Van Ryn Deep	33,736	16·107	45,068
Witwatersrand	30,729	15·880	25,555
January totals ...	£199,778	14·745	£126,738
December totals ...	£199,967	15·526	£120,237

Consolidated Gold Fields Group.

The following are particulars in regard to the outputs and profits for the month of January of the undermentioned companies of the Consolidated Gold Fields group:—

Company.	No. of Stamps.	Tube Mills.	Tons Crushed.	Gold declared. Fine Ozs.	Total Profit.
Simmer and Jack ..	320	7	63,800	17,354	£29,833
Robinson Deep ...	110	8	47,200	16,729	27,101
Knights Deep ...	400	11	100,450	16,939	12,201
Simmer Deep ...	180	9	63,100	12,306	5,008
Sub Nigel	20	1	4,530	2,145	1,257
Totals	1030	36	279,080	65,473	£75,400

The sundry revenue included in the above total declared profit is as under:—Simmer and Jack, £1,800; Robinson Deep, £358; Knights Deep, £478; Simmer Deep, £250; Sub Nigel, £189; total, £3,075.

Reserve Gold.—Simmer and Jack, 7,750 ozs.; Robinson Deep, 3,162 ozs.; Simmer Deep, 2,928 ozs.; Sub Nigel, 340 ozs.; total, 14,180 ozs.

HAVE YOU EVER CONSIDERED THE WEAR OF RODS

caused by packings that do not contain lubricant but are friction producing ?

"PALMETTO" PACKING

is so constructed as to permit the rod to slide along it without resistance.

The bearing surface against the rod is kept in a constant state of lubrication from the packing itself, and

DOES NOT WEAR THE RODS.

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BARTLE & CO., Ltd., Johannesburg.
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The Wolhuter Gold Mines, Limited.

(Incorporated in the Transvaal.)

NOTICE TO SHAREHOLDERS.

NOTICE IS HEREBY GIVEN that the Seventeenth Ordinary General Meeting of Shareholders in the above-named Company will be held in the Company's Board-room, Cullinan Building, Johannesburg, on FRIDAY, the 26th MARCH, 1915, at 11 a.m.

BUSINESS.

1. To receive the Directors' Report and Financial Statements for the year ended 31st October, 1914.
2. To elect Directors in the place of the present Board, who retire in terms of the Company's Articles of Association, but are eligible and offer themselves for re-election.
3. To appoint Auditors in the place of Messrs. A. Eckart-Beckmann and H. J. Macrae, who retire, but are eligible for reappointment, and to fix their remuneration for past services.
4. To transact any other business which may be transacted at an Ordinary General Meeting, or which is brought under the consideration of the meeting by the Report of the Directors.

The London Transfer Registers of the Company will be closed from the 1st to the 8th March, 1915, both days inclusive, and the Head Office Transfer Registers of the Company will be closed from the 22nd March to the 9th April, 1915, both days inclusive.

Holders of Share Warrants to Bearer desiring to vote must deposit their Share Warrants at the Head Office of the Company, Johannesburg, at least 24 hours before such General Meeting, or at the London Office, Salisbury House, London Wall, E.C., on or before the 2nd March, 1915, together with a statement in writing of the name and address of the holder of the warrants, in exchange for which a certificate will be given entitling the holder of the warrants to attend and vote at the meeting in respect of the shares specified in such certificate.

By Order of the Board,
A. GREGOR,
Acting Secretary.

Head Office, Johannesburg,
5th December, 1914

Bucks Reef Gold Mines, Limited.

(Incorporated in Rhodesia).

NOTICE TO SHAREHOLDERS.

NOTICE IS HEREBY GIVEN that the Sixth Ordinary General Meeting of Shareholders in the above-named Company will be held in the Board-room, Cullinan Building, Johannesburg, on FRIDAY, the 26th MARCH, 1915, at 11.30 a.m.

BUSINESS.

1. To receive the Financial Statements, Reports, etc., for the year ended 31st December, 1914.
2. To elect two Directors in the place of Mr. J. H. Ryan and Mr. P. Dreyfus, who retire by rotation, but are eligible, and offer themselves for re-election.
3. To appoint Auditors in the place of Messrs. Deloitte, Plender, Griffiths, Annan & Co., who retire, but are eligible for reappointment, and to fix their remuneration for past services.
4. To transact any other business which may be transacted at an Ordinary General Meeting, or which is brought under the consideration of the meeting by the Report of the Directors.

The London Transfer Registers of the Company will be closed from the 1st March to the 8th March, 1915, both days inclusive, and the Head Office Transfer Registers of the Company will be closed from 22nd March to the 9th April, 1915, both days inclusive.

By Order of the Board,
A. GREGOR,
Acting Secretary.

Head Office, Johannesburg,
15th December, 1914.

FLOWER BRAND MAGNOLIA METAL
HAS
A CO-EFFICIENT OF FRICTION FROM $33\frac{1}{3}\%$ TO 50%
LOWER THAN ANY OTHER ANTI-FRICTION METAL.

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ole Agents for South Africa: FRASER & CHALMERS, Ltd., Johannesburg, Bulawayo & Salisbury.

Engineering Notes and News.

£186,074 Spent on Irrigation.

The report of the Auditor-General shows that during the last financial year £186,074 was advanced for irrigation ventures as follows:—Olifants River Irrigation Board, £15,581; Baroda Irrigation Board, £5,000; Calitzdorp Irrigation Board, £15,041; Le Chasseur and Goree Irrigation Board, £12,000; Hayham Abrahamson Irrigation Board, £30,000; Duivenhoks River Irrigation Board, £3,500; and Strathsomers Estate Company, £5,000; Minor loans to Irrigation Boards and farmers totalled £99,952.

Coke Motor Bus.

SELF-STOKING FOR FIFTY MILES.

South African municipalities that find trouble with motor busses will be interested to know that the latest novelty in London streets is a coke motor omnibus. It is one of the fleet of the National Steam Car Company and is running between Dulwich and Shepherd's Bush. A really efficient car which can be run on an economical fuel such as coke in the place of petrol or paraffin marks an important advance, and the Royal Automobile Club has awarded the company the handsome Dewar Challenge Trophy for the most meritorious achievement of the year in automobile engineering. Instead of having a furnace fed with paraffin, the new omnibus automatically stokes itself with coke. The bunkers are inside the bonnet and surround the boiler. Thus not only is the coke kept dry and warm but also it acts as lagging to the boiler and prevents loss of heat. It is a small vertical boiler, with the furnace underneath; and mechanical feeders, which may be likened to the fingers of a hand, pass the coke downwards to the fire. An ingenious device prevents clinkering. The bunkers, which can be easily replenished, hold sufficient coke for a run of 50 to 60 miles. On a trial trip to Brighton and back a lorry weighing, with its load, $6\frac{1}{2}$ tons used 446 lbs. of coke in $106\frac{1}{2}$ miles and ran $87\frac{3}{4}$ miles before it was necessary to stop for water. The average speed was 12 miles an hour.

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For those holding Certificates as Mine Managers, Mine Surveyors, Mine Captains, Mechanical and Electrical Engineers and Engine-Drivers. Private Individual Tuition and Correspondence lessons where personal tuition is impossible. Practical Mathematics and Electrotechnics.—E. J. MOYNIHAN, Consulting Engineer, 35-6, Cuthberts' Buildings, Box 2061, Johannesburg.

War and the Engineering Trade.

A North of England correspondent writes:—The marked improvement which has taken place in several branches of industry, notably the shipbuilding and iron and steel trades, is fully maintained, and the present conditions give indication of still further improvement. Orderings by the Admiralty and the War Office of our own country and the war departments of our Allies still have a marked influence on the manufacturing position, but there are indications of expanding business in other directions. All the big iron and steel firms are fully booked with orders, and the smaller concerns report the same state of things. The remarkably good position of the iron and steel trades is acknowledged on all sides. William Jacks and Co., of Middlesbrough, Glasgow and other places, who from their position as one of the largest firms of iron and steel merchants in the world may be accounted as a most reliable authority, express the opinion in their annual circular that the present improvement is based on a much more solid foundation than that which occurred immediately after the outbreak of war. But to form any reliable forecast of the year upon which we have just entered is unusually difficult, owing to the abnormal circumstances created by the war. How long will the war continue? While it does continue, can we expect any sustained improvement? When peace is declared what will the immediate effect on our trade be? The answer to the last question, state Messrs. Jacks, depends on the answer to the first, to which no answer can be given. If the war does not end until German territory is occupied and her industries ruined, as has taken place in Belgium, then whatever trade there is must be mainly done by America and Britain, but will not the wastage of capital, which such a prolonged war would involve, mean a considerable period of recuperation? If, on the other hand, Germany accepts the Allies' terms, with all her industrial resources intact, will there not be as keen competition as ever from that quarter in all markets? Again, what will be the immediate effect of our trade when the enormous requirements of the various Governments at war are, as a result of peace, no longer necessary? It is unquestionably these requirements that have given the needed stimulus to the trade just now. A most important point is the question of shipbuilding. Shipbuilders are exceptionally busy, and while this, again, is in a large measure due to Government work, it is also on account of orders to replace commercial tonnage destroyed since war began, the result of which is seen in the abnormally high freights now ruling, to which, indeed, is largely due the increased prices required for pig iron, especially hematite. The question here is whether shipowners will continue to replace these losses at the enhanced costs of to-day, in view of the considerable delay there must be in obtaining delivery, rendering it doubtful whether such tonnage may not be too late to reap the benefit of current freights, bearing in mind that the large amount of tonnage at present interned may be released ere the new tonnage is available. It must be borne in mind that though the trade of America is still in a depressed condition, the output there being only about half the capacity, that country has taken the place of the Continent to a considerable extent in the supply of semi manufactured steel to this country. The situation is full of possibilities, and there is plenty of room for individual opinions, which as they find expression from time to time as the war progresses may cause sharp movements in the market throughout the year. Broadly speaking, a good year's trade is anticipated.

When communicating with advertisers kindly mention the *South African Mining Journal*.

Electrical Notes and News.

The Prevention of Accidents from Electrical Causes in Mines.

According to Mr. T. J. Nelson, a member of the Association of Mining Electrical Engineers, in order to provide against accidents due to shock, ignition, or fire, due to electrical causes, it is necessary to provide reliable connection to earth of all outer metallic covers of apparatus, to cover all live parts with good quality insulating material, to use apparatus designed to prevent open sparking, and to avoid the use of inflammable material near electrical apparatus. The Home Office rules for securing safety were admirable, but there were various properties of electrical plant only influenced indirectly by them. Dealing with the requirements of mining motors, Mr. Nelson favours the bar-wound slip-ring induction motor for coal-cutters. Coal-cutter trailing cables were preferably not armoured, but should contain a separate earthing conductor. Underground lighting should never be carried out by lamps in series on a medium-pressure supply. When alternating current is used it should be transformed down to 50 volts for lighting purposes. All bells and signalling keys should be in explosion-proof cases. From the point of view of safety, the earthing system is of vital importance. Earth plates should be sunk where the ground is damp, and copper earth-wires should be provided, bonded to the cable armouring at intervals, instead of relying only on the continuity of the armouring. The resistance of the earth circuit which has to be met—not more than twice that of the largest conductor in the system—could easily be measured by means of the "ducter." For large installations Mr. Nelson recommends the use of local earths underground in case of the main earth becoming faulty.

Electric Shot-firing from the Surface.

In a paper published in the *Transactions* of the American Institute of Mining Engineers, G. S. Rice and H. H. Clark describe a system of shot-firing by electric circuit from the surface, which was first adopted in Utah in 1900, and has since been employed in several other States. They state that initial troubles from miss-fires and premature firing have now been reduced to a very small number, and the system has proved very advantageous where the practice of "shooting off the solid" exists, and large charges of black powder and dynamite are used. By an Order issued by the United States Secretary of the Interior, the use of other than "permissible" explosives is prohibited from January 1, 1915, but this Order is relaxed where the holes are loaded and the shots fired by special shot-firers using an electric system from without the mine. Outside firing, as compared with inside firing, requires larger firing generators, larger conductors for distributing the current, better insulation on the conductors, and better insulators to support them. The authors offer a tentative specification for a suitable system, comprising a direct-current 250 volt compound-wound generator having a momentary capacity of about 30 kw.; conductors capable of passing at least 1·25 amperes through each room or heading circuit immediately upon closing the firing switch (this current will ensure that three or four electric igniters or detonators will explode, even if they vary in resistance 25 per cent. above and below the average); the conductors should be insulated with rubber, and be supported upon glass or porcelain insulators placed so near together that the wires do not touch anything; care should be exercised to secure that the unsupported wires connecting the circuit with the face do not make contact with the floor if it is wet; the detonators in a room should be connected in series, but the room and entry circuits should be connected in parallel; there should be a double-pole single-throw switch at the entrance to each room or heading of entry, and at the mouth of each entry a double-pole single-throw 50-ampere switch; at the foot of the shaft two plugs should be provided with flexible lines not less than 5 ft. long further to protect the main circuit of the system until all the men have left the mine, and provision should be made for locking the plugs out of circuit; in the shotfirer's cabin there should be a switch in a locked box so designed that it can be thrown but once without operating a locked clog, cam latch, or other restraining device; in the power-house there should be a switch in a locked box for connecting the shot-firing circuit to the generator or power line, which would be thrown in by the shotfirer before closing the shot-firing switch. At it is essential that no men should remain in the mine during the operation of shot-firing, "a checking in-and-out system is advocated as an additional precaution. The object of having all the shots connected in series is twofold—(1) to prevent the amount of current falling below that which is necessary to discharge the detonators, and (2) to ensure that all of the shots in a room or heading be discharged or none at all. Of course, delayed detonators may be used to enable the shots to be counted, but this system is open to abuse. Experience has indicated that the effect upon the mine of discharging shots throughout the mine at one time is no more severe than when the shots are fired by sections. It would seem that the local pressures set up by the shots in the different rooms and entries neutralise one another, so that there is no general concussion wave started. The expense of a new installation, apart from the generators, varies from 1,000 dollars to 3,000 dollars, according to the size of the mine.

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THE WEEK IN THE SHAREMARKET.

Steady and Quiet—Specialities in Demand—Far Easts in Favour—Springs Mines the Feature.

PRICES remained steady this week, though the volume of business put through was not large. Tins were quieter; and in the gold market, Springs and Modder Deeps were the favourites. The former is said to be showing splendid development results; and an official announcement will be found elsewhere in this issue regarding the financial arrangements of the company. Modder Deep ore reserves, now being re-calculated, will show a notable improvement, and these two stocks remain favourites with the public.

* * * *

Another Stock Exchange correspondent writes:—During the week tin stocks fluctuated slightly according to the market price of the metal, but the business was on a small scale. Modder Deeps were prominently to the fore, and the price ranged between the small limits of 60s. 3d. to 61s. 3d. The only little excitement was on Tuesday when Springs Mines were offered down and suddenly rose the following day to 14s. But every day there were enquiries for low-priced shares such as Cloverfields, East Rand Coals, East Rand Deeps, East Rand Centrals, Rand Klips and Sallies. In Nationals and Harrisdales there was a considerable turnover.

	Fri., 5th.	Sat., 6th.	Mon., 8th.	Tues., 9th.	Wed., 10th.	Thurs., 11th.
Adair Ushers	—	0 4*	..	0. 4*	—	0 4*
African Farms	9 0*	9 1	9 1	9 1	9 0*	9 0*
Apex Mines	—	12 6*	12 6*	12 6*	12 6	12 6*
Bantjes Cons.	8 3*	8 0*	8 6*	8 3*	8 3*	8 3*
Brakpan Mines	45 6*	45 6*	—	45 6†	45 6†	—
Breyten Collieries	20 0*	20 0*	20 0*	—	20 0*	20 0*
Bushveld Tins	0 4*	0 6†	0 4*	0 5*	0 5*	0 5*
Cassel Coals	—	—	—	—	—	10 0*
Cinderella Cons.	—	—	—	3 6*	3 6*	3 6*
City & Suburbans	42 6*	43 0*	43 0*	43 0*	43 6*	43 9*
City Deeps	56 6	56 0*	55 6*	56 0*	55 6*	55 0*
Cloverfield Mines	4 0*	4 1*	4 0*	4 0*	4 0*	4 0*
Clydesdale Colls.	8 0*	8 0*	8 0*	8 0*	8 0*	8 0*
Con. Langlaagtes	32 9†	32 0*	32 0*	32 0*	31 9	32 6
Con. Main Reefs	16 6*	16 7*	16 6*	16 7*	17 0†	—
Coronation Collieries	—	—	21 0*	—	—	—
Coronation Syndicates	—	—	1 0*	—	—	—
Crown Mines	72 0*	72 0*	72 0*	73 9*	73 9*	73 9*
East Rand Centrals	2 0*	2 0*	2 0*	2 0*	2 0*	2 0*
East Rand Coals	1 5*	1 5*	1 5*	1 5	—	1 4*
East Rand Deeps	1 4*	—	1 4*	1 4*	1 4*	1 4*
East Rand Props.	28 0*	28 0*	—	28 0*	—	27 6*
East Rand Debentures	—	—	—	£86*	£87½*	£87½*
Eastern Golds	1 0*	1 0*	1 0*	1 0*	—	1 0
Frank Smith Diam.	1 4*	1 4*	—	1 4*	1 4*	1 4*
Geduld Props.	21 3	21 3*	21 0*	21 0*	20 6*	21 0
Ginsbergs	—	—	16 0†	15 0†	15 0†	13 6†
Glencairns	1 0*	1 0*	1 0*	1 0*	1 0*	1 0*
Glencoe Collieries	5 9*	5 9*	5 9*	5 9*	6 0*	—
Government Areas	16 6*	17 7½*	17 0	16 9*	17 0	17 0*
Jupiters	3 6*	3 6*	4 6	4 0*	3 6*	3 6*
Kaalfontein Diam.	0 3*	0 3*	0 3*	—	0 4	0 3*
Klerksdorp Props.	2 9†	—	2 9†	2 6†	2 6†	2 3†
Knight Centrals	5 6*	5 6*	5 0*	5 8†	5 3*	5 4*
Knights Deeps	—	—	—	—	—	26 0†
Lace Props.	3 3	3 1*	3 1*	3 1*	3 1*	3 1*
Langlaagte Estates	16 6*	16 6*	16 6*	17 0*	17 0*	17 0*
Luipaardsvlei Est.	7 6*	7 6*	7 6*	7 9*	7 6*	—
Lydenburg Farms	2 6*	2 7*	2 6*	2 7*	2 7*	2 7*
Main Reef Wests	5 6*	5 6*	—	—	6 0†	6 0†
Meyer & Charltons	90 0*	—	—	—	—	—
Middlevlei Est.	1 6*	1 6*	1 6*	1 6*	1 6*	1 6*
Modder B.'s	90 0†	—	90 0†	90 0†	88 0*	90 0†
Modder Deeps	61 6	60 0*	60 9*	60 6	60 6	60 6*
National Banks	—	—	£11½†	—	—	£11½†
New Era Cons.	—	—	4 10*	5 3†	5 3†	5 3†
New Geduld Deeps	1 9*	1 9*	1 9*	1 9	1 9*	1 9*
New Gochs	12 6*	12 9*	12 9*	12 9*	12 9*	12 9*
New Heriots	61 0*	—	60 0*	61 0*	61 6*	61 0*
New Kleinfonteins	19 4*	19 4½	19 3*	19 4½	19 0*	19 3
New Modderfonteins	—	—	—	—	250 0*	—
New Unifieds	19 0†	18 0*	17 6*	—	19 6†	—
Orange Diamonds	0 9*	0 9*	0 10*	0 9*	0 9*	—
Pretoria Cements	44 6*	44 6	44 6*	44 6	44 0*	44 0*
Princess Estates	—	2 6*	2 9*	3 0*	3 0*	4 6
Rand Klips	2 9*	2 9*	2 9*	2 9	2 7*	2 7*
Rand Nucleus	1 6*	1 6*	1 6*	1 7	1 6*	1 7
Randfontein Deeps	2 11*	3 0†	3 0†	2 9*	2 9*	3 0†
Randfontein Est.	15 3*	15 3	15 0*	15 0*	15 0*	15 0*
Rooibergs	21 6*	21 9*	21 6*	21 6*	21 0*	22 6†
Roodepoort Uniteds	—	6 0†	6 0†	—	6 0†	6 0†
Shebas	—	—	2 0*	2 6*	2 6*	2 6*
Simmer Deeps	1 6*	1 6*	—	1 6	—	1 6*
S.A. Lands	2 4*	2 4*	2 4*	2 4*	2 4*	2 4*
Springs Mines	13 3	13 0*	12 6*	11 9	12 6*	13 0*
Standard Banks	—	—	—	£10½†	—	—
Sub-Nigels	9 0*	9 3*	9 3*	9 3*	9 6*	9 0*
Swaziland Tins	22 6*	22 6*	22 6*	22 6*	22 6*	22 6*
Transvaal Coal Trust	30 6*	—	30 0*	32 0†	29 0*	30 9*
Trans. G.M. Est.	34 0*	36 0†	34 6*	34 6*	—	35 0
Van Ryn Deeps	44 6*	45 3	45 6	45 6†	45 0	45 0
Village Deeps	36 0†	36 0†	—	35 6†	36 0†	35 0*
West Rand Cons.	2 6*	—	4 6*	4 9*	—	4 9*
Witwatersrands	59 0*	—	—	—	—	61 0†
Wit. Deeps	36 6†	—	—	36 0†	34 0*	—
Wolhuters	12 6	12 9*	12 9*	12 9*	12 9*	12 9*
Zaaiplaats Tins	25 6	25 6	26 0	25 6*	25 6*	25 0*

*Buyers. †Sellers.

Glynn's Lydenburg.

The following are the particulars of this company's output for the month of January, 1915:—Tons crushed, 3,603, yielding 1,277 fine ozs.; estimated value of month's output, £5,347; estimated profit for the month, £1,546. Results were abnormal, owing to effects of exceptionally heavy rains and thunderstorms.

Transvaal G.M. Estates.

The following are the particulars of the T.G.M.E. output for the month of January, 1915:—Central Mines: Tons crushed, 8,100, yielding 4,451·932 fine ozs. Elandsdrift Mine: Tons crushed, 650, yielding 1,080·708 fine ozs. Vaalhoek Mine: Tons crushed, 1,370, yielding 487·236 fine ozs. Estimated value of month's output, £25,241; estimated profit for the month, £11,038. Low profit due to conditions already reported.

Worcester.

The Worcester Gold Mining Company's report for January shows that the tonnage crushed was 4,850 tons; the yield from the mill was 532·196 ozs.; and the yield from cyanide, 351·345 ozs.; total yield, 883·541 ozs., valued at £3,732 19s 2d. The approximate profit was £250. Excessive rains partially flooding the cataract power plant affected the tonnage crushed.

Apple Growing in Tasmania.

We desire to draw attention to the fact that recently several South Africans have, after thorough investigation, invested in orcharding in Tasmania, under our absentee system. Under this system we plant and manage for absentee owners, with extended payments, under Government expert supervision until such time as it suits them to take possession in person. This provides a good investment and a future home in Tasmania, where climate, scenery and social conditions are ideal. We are now managing for over seventy absentees. Land situated on fine navigable waterway. Pamphlets, giving full particulars, forwarded on application to our Mr. J. P. Johnson (for many years on the Rand, and now settled on our Kelso Estate), who can be interviewed at the Grand National Hotel, Rissik Street, Johannesburg. Messrs. Sadleir & Knight, Orchard Agents and Attorneys, Launceston, Tasmania.—Advt.

Commerce and Industries.

Competition With Germany.

In connection with the campaign undertaken by the Board of Trade on the advice of its Advisory Committee on Commercial Intelligence to assist British manufacturers and merchants to secure trade formerly in the hands of German or Austro-Hungarian firms, the Board continues to receive a very large number of inquiries for the names of sellers or buyers of articles of which the sources of supply or market have been interfered with by the war. Special arrangements have been made in the Commercial Intelligence Branch of the Board of Trade for dealing with these inquiries, and lists are prepared and circulated of articles which inquirers desire (a) to purchase and (b) to sell. The seventh list is now ready, and may be obtained by United Kingdom manufacturers and traders, together with copies of the previous lists on application to the Branch. British firms interested in any of the goods mentioned either as buyers or sellers, should communicate with the Director of the Commercial Intelligence Branch of the Board of Trade, 73 Basinghall Street, E.C.

* * * *

International Dynamite Syndicate.

The war has brought automatically to an end various international agreements in the iron and steel trades, and in all probability it will also be the means of terminating the international syndicate which has exercised for many years past a controlling influence on the manufacture of explosives for the purposes of war as well as, to a certain extent, on explosives for mining and other industrial applications in different parts of the world. We refer, of course, to the dynamite syndicate, which includes British and Australian companies and German and Austrian works, the latter group of which now freely admits, under the prevailing conditions of war, that the arrangements hitherto existing with British interests have been of considerable advantage to Germany and Austria-Hungary, from a military point of view and also from a financial standpoint. It is uncertain for the moment how many years the agreements between the British and Teutonic companies have been in operation, but it is known that the group of gunpowder works in Rhenish-Westphalia and the Hamburg group of powder works formed an association of their own as far back as the end of 1889. The understanding was subsequently extended to the German explosives or dynamite works and consequently to the British firms who were already in syndicate relationship with the latter. The trust is said still to control the German dynamite group, while on the other, 60 per cent. of the trust company's shares are declared to be in German ownership. It is possible that the one financial interest may balance the other; but it is not very reassuring to hear that the majority control of the British shares is vested in the hands of an alien enemy, notwithstanding that the latter is now deprived of any further revenue from this source. It may be assumed that the British connection with the Austrian Nobel Dynamite Company will also be determined, whereas that with the French and South African companies will continue in operation, provided that Teutonic interest are not concerned with the latter.

To Capture British Trade.

Investigations have revealed the fact (states the British Empire Industrial League) that within the last three months many applications for patents in Great Britain have emanated from or been made on behalf of German manufacturers. Many German manufacturers, foreseeing the embittered state of public feeling that will exist in regard to them for many years, are seeking to protect their trade connections all over the world by establishing branch works in Great Britain. These factories, the officials of the League say, will be carried on by firms bearing British names, and will not be suspected by the general public as being other than British. They will benefit the British workers very slightly so far as labour is concerned, but, on the other hand, they will be doing our men and manufacturers serious injury by depriving the one of his employment and the other of a portion of his trade connection in a deceitful and underhand manner. This procedure will enable the Germans to label their goods as British-made. It is urged that the Government and British manufacturers and merchants should take measures to defeat the enemy's new trade scheme.

* * * *

Natal's Wattle Trade.

The wattle trade in Natal is now in an unfortunate position. The war in Europe seriously affected the trade from the start, but there are other considerations now operating adversely against the trade. The fact that Great Britain has prohibited the export of bark to Sweden and that Australia is contemplating levying a duty of 30s. a ton on Natal bark are causing anxiety. Another adverse factor is the ravages of the bug-worm pest, which is eating up wattle all over the Province. Acting on representations by the leading growers, Government has decided to re-engage Mr. Hardenberg, the expert, who has been studying the bug-worm pest for the past two years, for a further period of two years. There are very few inquiries for bark now.

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Costs of Commissions.

The Union Government spent £32,946 on Commissions during the year 1913-14. In round figures the expenses on each Commission were: Assaults on Women, £4,511; Commerce and Industries, £5,596; Delimitation (No. 2), £736; Economic, £2,913; Indian Judicial Inquiry, £581; Native Lands, £2,722; Small Holdings, £859; Sunday Observance, £3,613; Trade Marks, Patents, etc., £8; Tuberculosis and Pneumonia, £9,693; Uninersity, £835; and Witwatersrand Disturbances, £869.

* * * *

Building Trade Stagnant.

Building enterprise, as reflected by plans passed by municipalities in January, shows no signs of reviving. Seven Transvaal municipalities approved plans aggregating £38,828, as compared with £24,934 in December. The increase is encouraging, but there is no prospect of the monthly average of over £80,000 maintained before the war being regained in the near future. At the Cape, seven municipalities approved plans aggregating £30,475, and Durban passed £33,372. Tenders accepted by the Public Works Department amounted to £18,549. Throughout the Union, employees in the building trades have been specially hard hit. Johannesburg reports that a little work of a temporary nature is going on as the result of the wet weather, plumbers, painters and paperhangers getting the chief benefit, and it is expected that some "jerry" buildings which collapsed during the heavy rains will be rebuilt immediately. Good and reliable men in all sections of these trades are among the unemployed. At Pretoria scarcely any building work is going on. Calls by the military authorities have relieved unemployment among builders' artisans at the Cape, but cutting seems to be the rule in competition for what contracts are going. At least, the report says: "Prices for work are ruling low, and many contractors refrain from tendering." Even greater stringency is anticipated, for it is noted that many contracts running are nearing completion, and that few new ones are in sight. On the other hand, Durban anticipates an improvement in February.

Engineering Trade Activity.

The Johannesburg Labour Bureau reports as follows for January:—" Owing to the mines having been able to keep running as usual, the engineering trades have been kept pretty well employed. Printers, on the other hand, have had a hard experience during the past six months, and, except the usual extra work at the Christmas season, short time has been the rule. The few industries unusually active are bootmaking, saddlery and leather workers, tailors, some lines in engineering, and the construction of vehicles. Several good orders for large iron tanks have been placed locally, and the heavy plate rivetters will be pretty well employed for some time to come. In the moulding shops the position is varied; some are quite busy, others quiet to dull, where the workmen are laid off in turns for a day or two rather than discharge them. The stamped tinware trade is busy, and the number of white employees continues to increase. Machine joinery shops were dull, not half the usual number of men being employed in several shops; but orders are expected to come in and improve the position during the present month. Leather workers are fully employed, not a competent hand requiring to be idle. Persistent advertising is credited with keeping furniture makers fairly well employed. A good number of hands are employed, and this class of work is increasing considerably. Milling is fairly active. While monumental work is quiet, an increasing demand for local granites is observed.

* * * *

Standard Bank of South Africa.

The directors of the Standard Bank of South Africa, Ltd., have issued a work, entitled "The History of the Standard Bank of South Africa, Limited, 1862-1913." The volume is the work of the late Mr. George Thomas Amphlett, former assistant general manager, who died in February, 1914. The manuscript was completed before his death, and the history is now published by the directors "as their last tribute to the memory of a faithful and devoted

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servant of the bank." The bank originated with certain Port Elizabeth merchants, most prominent amongst whom was Mr. John Paterson, its first chairman, and the progress made is well shown in some tables at the end of the volume. The first accounts showed that the paid up capital was £72,950. At the end of 1913 the amount was £1,548,525. A reserve fund was started at the very inception, and amounted to £10,100. At the end of 1913 it was £2,000,000 The first accounts show a combined total of notes in circulation and deposits of £114,151. At the end of 1913 the former item amounted to £1,119,131, and the latter to £20,900,321. Probably to the general public the most interesting part of the book will be that devoted to the history of the bank during the Transvaal war from 1899 to 1902. The book forms a handsome quarto volume of over 250 pages; it is well illustrated with photographs and maps, and contains in appendices an account of the claim against the Imperial Government in the matter of the specie commandeered by the Government of the late South African Republic from British banks. The volume forms an interesting addition to financial literature.

Natal Coal Returns.

In December the average number of white men employed in the coal mines of the Natal Province was 480, as against 551 in the corresponding month of 1913; the Asiatics numbered 3,571, as against 3,773; and the natives 7,116, as against 6,775. The total labour force was 11,167, as compared with 11,099 the previous year. The coal mined was 175,383 tons as against 232,558 in December, 1913. The bunker coal at Durban was 88,808; 22,959 tons were exported oversea and 17,264 tons to Union ports.

A diamond pendant belonging to Lady Dewar was produced by Professor C. V. Boys at the Royal Institution in mail week for the purpose of illustrating a point in the course of the last of his series of science lectures. "You talk about flashing gems," he said, "but the reason why the diamond flashes more brilliantly than other gems is because all the light which falls on a cut diamond strikes the various facets at such angles and in such a manner that the whole of the light comes out again at the front. As it has been refracted, some of the light comes out coloured." Placing the gem in a shaft of light from a lantern, the Professor gave a striking illustration of this peculiarity. He also devoted some time to the explanation of the mechanism of the reflex red light now so generally attached to the rear of bicycles as a warning to overtaking motorists. "The base of this light is so curved," he said, "that however much the bicycle 'wobbles' the light from the motor head lamp is always reflected straight back to the motor." A statement which probably surprised many present was that the peacock's feather contains no pigment at all. The iridescent colours of the butterfly and many of the beetles, Professor Boys said, was not produced by pigment at all.

Goerz Group Quarterly Reports.

In the quarter ended the 31st December, the Princess Estate and G.M. Co. made a working profit of £3,193 0s. 2d. The total expenditure, including mine development redemption, amounted to £81,630 17s. 3d., equal to 24s. 5·3d. per ton milled, and the revenue from gold to £84,823 17s. 5d., equal to 25s. 4·7d. per ton. The profit was £2,637 less than in the previous quarter owing to the value per ton of gold being less by 3·3d. and an increase in the working costs of 6·2d. per ton. Expenditure at the May Consolidated in the same quarter amounted to £26,088 7s. 6d., equal to 13s. 8·9d. per ton milled, and the revenue from gold to £27,621 3s. 8d., or 14s. 6·6d. per ton. The working profit was £1,532 16s. 2d. The results of the quarter, as compared with the previous one, show that the value per ton of gold was less by 4·5d., and the working costs a decrease of 4·1d. per ton; the tonnage milled was less by 970 tons, and the working profit dropped by £102. At the Geduld Proprietary Mines the revenue from gold was £108,179 3s. 1d., equal to 32s. 0·6d. per ton milled. The total working expenditure was £79,452 8s. 9d., or 23s. 6·5d. per ton, and the working profit £28,726 14s. 4d. The supply of native labour has again been unsatisfactory, but shows signs of improvement. As labour increases, the tonnage milled and the footage developed will both be raised. A reserve of 5,324 ozs., obtained from a small block of ore of exceptional value, is in hand.

S.A.R. Accepted Tenders.

The following statement of accepted tenders is published for general information :—Steam coal for 1915—Natal Province : 22,000 to 78,000 tons, Wallsend Natal Collieries, Ltd., Durban; 12,000 to 39,000 tons, Natal Steam Coal Co., Ltd., Durban; 13,200 to 46,800 tons, Dundee Coal Co., Ltd., Durban (Burnside); 17,600 to 30,000 tons, Hattingspruit Collieries, Ltd., Durban; 10,780 to 38,220 tons, Elandslaagte Collieries, Ltd., Elandslaagte. Incandescent Lamps—Items 1 to 47 : S.A. General Electric Co., J'burg. Train Lighting Lamps—Items 1 to 5 : R. H. Gould & Co., J'burg. Miscellaneous coal for 1915—Natal Province : 7,000 tons smithy nut coal (washed), Elandslaagte Collieries, Ltd., Elandslaagte; 7,200 tons pea coal (washed), Ramsay Collieries, Durban; 3,200 tons dross or slack, Natal Steam Coal Co., Ltd., Durban; 5,500 tons household round, Natal Steam Coal Co., Ltd., Durban; 2,200 tons household nuts, Natal Steam Coal Co., Ltd., Durban. Soap : Soft soap, New Transvaal Chemical Works, Delmore; hard yellow soap, Lever Bros. (S.A.), Ltd., Durban; toilet soap, Lever Bros. (S.A.), Ltd., Durban.

INVESTORS' DIARY.

FORTHCOMING COMPANY MEETINGS.

Feb. 26.—Southern Freeholds; South Deeps; East Rietfontein Syndicate.
Feb. 8.—Haenertsburg Gold and Copper.
March 15.—Worcester Exploration Co.
March 26.—Jupiter G.M. Co.; Simmer Deep; Wolhuter; Bucks Reef.

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THE SOUTH AFRICAN

Mining Journal,

WITH WHICH IS INCORPORATED

South African Mines, Commerce and Industries.

ESTABLISHED 1891.

VOL. XXIV., PART I.] FEBRUARY 20, 1915. [No. 1221.

HEAD OFFICE: 176-180, Stock Exchange Buildings, Fox Street (2nd Floor), Johannesburg, Union of South Africa.

Telephone **913.** P.O. Boxes **963** and **418.**

Cable and Telegraphic Address: "**MINING JOURNAL.**"

AGENTS FOR GREAT BRITAIN: Argus Printing and Publishing Co., Ltd., Byron House, 82-85, Fleet Street, London, E.C.

AMERICA: Gotham Advertising Co., 95, Liberty Street, New York.

ANNUAL SUBSCRIPTION RATES: Oversea, £2; South Africa (by post), £1 10s.; Local Delivery (Town only), £1 6s.

Copies of this journal are obtainable at all Branches and Agencies of the Central News Agency, Ltd., at all News Agents and Railway Bookstalls throughout South Africa, and at the London Agency as above.

NOTICE.—The postage of this issue of the *S.A. Mining Journal* is: South Africa, 1d. All other parts, 1½d.

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Notes and News.

Special Electrical Supplement.

With our next issue will appear a special supplement devoted to the position and progress of electrical engineering on the mines of the Rand and in South African railway and municipal service. Valuable papers and addresses will appear, notably that delivered before the Institute of Electrical Engineers this week, by Mr. Bernard Price, the new President of that body and Chief Engineer to the Victoria Falls and Transvaal Power Co.; by Mr. Elsdon Dew, of the Central Mining engineering staff; and by other leading authorities. Descriptions of the chief central power supply stations will be a feature; and the articles will be profusely illustrated. No extra charge will be made for the supplement.

* * * *

Union Steel of South Africa.

The annual report of the Union Steel Corporation (of South Africa), which has just been published, includes for the first time a profit and loss account. There is a loss on manufacture of £12,000 and the total deficit on working is £27,800. After adding certain expenses incurred prior to the past financial year there is an aggregate debit balance at profit and loss of £34,900. There are also in suspense in the balance sheet preliminary expenses and underwriting commission amounting to £13,400. Construction costs have been exceeded and have not yet finished, and the original issue designed to provide working capital proved inadequate, so that debentures to the extent of £100,000 had to be created. Of this sum £25,700 has been directly issued and £74,300 is lodged as collateral security for a loan of £39,400. Since the close of the financial year £42,000 eight per cent. participating preference shares have also been allotted. The directors think the worst of their troubles are now over. Bolt, nut, and rivet making machinery and sundry other small items of plant, as well as a considerable quantity of raw material, have been already shipped, while orders have been placed for a 15-in. and a 22-in. cogging mill. Instructions are being dispatched for the erection of an additional melting furnace, and a further re-heating furnace is in course of construction. It is estimated that when the new machinery and plant is put into commission the output capacity will be increased to about 10,000 tons per annum, whilst working costs will not increase to anything like a commensurate extent.

* * * *

Miners' Health at Broken Hill.

A commission of three has submitted an important report to the New South Wales Parliament on various phases of industrial conditions in the lead-zinc-silver mines at Broken Hill. They recommended the following:—(1) That no person suffering from tuberculosis be permitted to work underground. (2) All persons working underground be examined once in every six months by a medical officer appointed by the Government. (3) No person be permitted to work underground unless he can read and intelligibly speak the English language. (4) That lead poisoning and its *sequelæ* (results) be made diseases which are chargeable on the Miners' Accident Relief Fund. (5) Investigations be made as to the liability of miners at Broken Hill to pneumonia, and that compensation be given if this disease be found to be an added and exceptional risk of the miners' calling. (6) In mine air the maximum of CO_2 be 1 per cent., and the minimum of oxygen 19 per cent. (7) Provision be made on each level of any shaft to provide shelter from the cold air for those who are waiting to be hoisted to the surface.

* * * *

French Rand.

The annual report of the directors of the French Rand Gold Mining Co. for the year ended the 31st December, 1914, which will be presented to shareholders on the 31st March, records that during the year an agreement was arrived at with the owner of the Champ d'Or Gold Mine (which adjoins this company's property) for the working out of certain portions of the joint boundary pillar. The revenue derived from this source amounted to £797 13s. 6d., but the arrangement was terminated on the 31st October, 1914. In order to reduce expenses, 46 claims, equal in area to 43·901 mining claims, situated north of the outcrop, have been abandoned. The claim area is now equal to 462·585 claims. The net cash liability at 31st December, 1914, amounted to £33,179 13s. 7d., an increase of £2,660 13s. 6d. when compared with the previous year, which is accounted for as follows: Net loss for the year, as per profit and loss account, £4,168 9s. 9d.; increase in amount of sundry debtors, £142 10s. 9d.; total, £4,311 0s. 6d. Less decrease in book value of stores and materials, £1,029 0s. 3d.; furniture, £81; plant, etc., sold, £504 6s. 9d.; total, £1,650 7s.

* * * *

Tin in the Belgian Congo.

H.M. Vice-Consul for the Katanga district reports that the tin deposits at Busanga, which are in the name of the "Compagnie Union Minière," are alluvial and cover roughly 33,000 square yards with an average depth of one yard. The ore is in the form of cassiterite, containing 78 per cent. pure tin. So far, only primitive machinery has been used, principally constructed on the spot, but during six months prospecting work two tons of pure tin have been made. The first smelting gave 60 per cent. pure tin, no fluxing being necessary, and with an efficient smelting plant a higher percentage would doubtless be obtained. The mine is situated at the junction of the Lugupa and Lualaba rivers, about 70 miles north of Ruwe. The Lobito Bay—Katanga Railway will provide an economic route later on for the transportation of plant and products, but work has been suspended on account of the war.

* * * *

Premier Mine.

The outstanding features of the annual report of the Premier D.M. to October 31 last are the reduction in the recovery of diamonds and the lower prices obtained. The former is explained by the development of the eastern section of the mine between the 260 ft. and 310 ft. levels exposing a considerable quantity of floating reef intermixed with the blue ground. As approximately 30 p.c. of the total quantity treated from November, 1913, to March, 1914, was drawn from this source in order not to restrict future development work in that area, a decrease in the yield was of course only to be expected. The average yield for the period mentioned was 0.185 carat per load, while from April to August, when operations ceased it was 0.193 carat per load. The lower prices were attributable to the decreased public demand. At October 31, 1913, the stock of diamonds on hand stood at £461,802; twelve months later the amount had risen to £593,075. Reference is made to the Diamond Conference held in June and July last, and also fully to the reason for non-payment of the October preference dividend.

* * * *

Standardised Mining Terms.

In accordance with the recommendations of the Chamber of Mines of Victoria, several mining companies in that State have decided that certain mining terms shall carry specific meanings. In future " payable gold " will mean ore that will pay working expenses; " fair gold " will mean that the ore will yield profit, and " good gold " will connote all ore yielding upwards of 1 oz. per ton. So far so good, but it would be better if still greater precision were employed and, wherever possible, the exact values stated.

* * * *

Safety and Sanitation.

A correspondent writes that the feature in mail week in New York was the Safety and Sanitation Conference, held under the auspices of the American Museum of Safety, in connection with the Second Exposition of Safety and Sanitation at the Grand Central Palace. Meetings were held during the week, dealing with the question of safety and sanitation throughout the whole country, and in every phase of work. Many of the papers were illustrated by moving picture films. So many papers were presented that it would be impossible to list them at length, but the ones most interesting to the mining profession were " Safety in the Handling and Transportation of Explosives," by W. B. Dunn, Inspector of the Bureau of Explosives in New York. Various papers on fire prevention were given on Tuesday, December 15. Wednesday was industrial safety day, and the best papers were " Safety in Underground Construction," by Emil Diebitsch; " Recent Progress of Safety in the Steel Industry," by C. L. Close, head of the sanitation and welfare department of the U.S. Steel Corporation; "How the United States Government is Helping to Decrease Accidents in Mines," by H. M. Wilson, resident engineer of the Bureau of Mines Experiment Station at Pittsburgh. There were various other papers on standardization of safety devices and accident prevention. Thursday was devoted to transportation, and Friday to health and sanitation. Many good papers were presented, including one on conserving the health of workers at National Lead Co.'s plants, by Charles P. Tolman. Saturday was devoted to the welfare of employees, and a great variety of papers was presented. The sociological and safety work of the New Jersey Zinc Co. was described by Miss Florence Hughes, of the welfare department of that company. The exposition was even larger and more interesting than last year, and the museum's work is showing a gratifying growth and increased influence in public life.

* * * *

New Treasury Rules.

At the beginning of mail week the Imperial Treasury threw a bombshell in the heart of the financial world in the shape of new rules under which new issues of capital would have to be made. The following is the actual announcement of the Treasury:—

> " In connection with the reopening of Stock Exchanges the Treasury have had under consideration the general conditions under which new issues of capital in the United Kingdom can be permitted during the continuance of the war. It appears to the Treasury that in the present crisis all other considerations must be subordinated to the paramount necessity of husbanding the financial resources of the country with a view to the successful persecution of the war. Accordingly, they wish it to be understood that until further notice they feel it imperative in the national interest, that fresh issues of capital shall be approved by the Treasury before they are made. The Treasury approval will be governed by the following general conditions:—(1) Issues for undertakings carried on or to be carried on in the United Kingdom shall only be allowed where it is shown to the satisfaction of the Treasury that they are advisable in the national interest. (2) Issues or participations in issues for undertakings carried on or to be carried on in the British Empire Overseas shall only be allowed where it is shown to the satisfaction of the Treasury that urgent necessity and special circumstances exist. (3) Issues or participations in issues for undertakings carried on or to be carried on outside the British Empire shall not be allowed. (4) The Treasury will not in ordinary cases insist upon the above restrictions where issues are required for the renewal of Treasury Bills or other short investments held here and falling due of foreign or colonial Governments or municipal corporations or railways or other undertakings. All applications should be made in the first instance to the Treasury. The Treasury will not be prepared to approve, under paragraph 4 (3) of the temporary regulations for the reopening of the Stock Exchange, any dealings in new issues which have not been approved by the Treasury before they are made." These regulations, as they stand, have created a big discussion, which has grown the more their far-reaching effects have been realised. There is a real desire not to criticise, nor hamper, the Government in any of its actions, but the strong veto which it is proposed to place upon capital issues would appear to require some modification. Everyone understands and sympathises with the Government in its endeavour to conserve the country's financial resources so that it can be in a position to carry on the war to a satisfactory conclusion, and, no doubt, some such rules were needed, merely as a precautionary measure. On the other hand, the very simple maxim that "Money makes money" seems to have been forgotten and, instead of assisting trade to expand and produce more "silver bullets," the new rules, on their face, may restrict it."

* * * *

Diamond Industry from the " Cutters' " Standpoint.

A review of the position of the diamond trade and industry in the past year, such as is presented by the *Gazette de Hollande*, of 4th ult., naturally does not refer to the whole twelve months, but in reality to only seven months, as the diamond trade has in general temporarily ceased to exist since the outbreak of war at the beginning of August. For, although since then "something" has been sold, there is in a general sense no question of any dealings. The year 1914 was marked, like 1913, by an entire lack of animation and a significant standstill in business as a consequence of various circumstances. The result in 1913 was that failures or stoppages of payment followed quickly one upon the other, and in the beginning of 1914, too, they were not wanting. Three events were of very much importance for the diamond trade and were calculated to exercise direct influence on the course of affairs. The first was the passing of German diamonds into the hands of the London syndicate, the second was the holding of the Diamond Producers' Conference, and the third was the introduction of the metric carat on 1st June. The time between these happenings and the start of the war was, however, too short to give a clear indication of their influence on and significance for the diamond trade. The highest figure of export of cut diamonds to the United States occurred in the week ended 27th April, namely, Fl769,861—while the highest amount of raw imports was Fl86,848, in the week ended 26th January. In 1913 the highest such export figure was in the week ended 25th March, before the introduction in America of the raised tariff on cut diamonds, and amounted to Fl1,114,088. The highest figure for raw imports in 1913 was Fl388,983, in the week ended 12th May. During the whole of last year the unemployment figure in the Dutch diamond cutting trade was abnormally high. It began with 5,092 and remained about 4,000 of the 9,800 members of the association up to the end of July, when practically all its members were thrown out of work. Nothing is expected in the way of a revival during the war, but a period of prosperity will, it is hoped, follow the war.

* * * *

Diseases Peculiar to Miners.

Ankylostomiasis is unknown in British coal mines, and Mr. Johnstone, H.M.I.M., in whose division Cornwall is included, states that no cases in the Cornish mines were directly reported to him during 1913, but he has been informed "that recent investigations have shown that the disease has not been entirely eradicated in certain mines in Cornwall." The number of deaths from phthisis of miners in Cornwall who had at any time worked machine drills was 39, as against 31 for the previous year. Dr. J. S. Haldane, who has analysed the returns obtained from the sub-registrars of the Redruth registration districts, in writing to Mr. Johnstone, remarks that the figures for 1913 "are very disappointing. The number of deaths among men working machine drills has been about 50 per cent. greater than three years ago, and the increase is not merely due to men returning from the Transvaal, but also to men who have never worked machine drills outside of Cornwall. Out of the 14 men who had worked machine drills in Cornwall, only four had done the work since the Regulations of 1905 were introduced; 10 had worked partly before and partly after the introduction of the Regulations, while one had worked entirely before. It seems pretty clear, therefore, that the Regulations have not as yet proved effective in preventing the inhalation of stone dust. Of men who had never worked machine drills, 44 had died of lung disease, and 40 of phthisis, among whom the average age at death was 48. It is remarkable that no deaths from pneumonia are recorded. The apparent infrequency of deaths from pneumonia is characteristic of the returns for Cornish miners. Of the 40 who died from phthisis, 20 had worked in the Transvaal as well as in Cornwall, and eight had worked in Cornwall only. Of the 114 deaths among miners of all kinds, 79 (or 69 per cent.) were due to phthisis. This is a very heavy proportion. In an average English population of occupied and retired males, only about 14 per cent. die of phthisis, although about 35 per cent. die from respiratory diseases as a whole, as compared with 73 per cent. among miners in the Redruth district in 1913."

TOPICS OF THE WEEK.

MINE SAFETY AND SANITATION.

To our mind quite the most satisfactory feature of last year on the Rand was the progress shown by the movement to promote safety and sanitation on the mines, and we shall be surprised if our mining company chairmen at the approaching annual meetings do not claim due credit for this excellent development. In regard to the whole question of conserving human life it cannot be denied that the Rand, up to a few years ago, was somewhat indifferent; and though we may have led the mining fields of the world in regard to metallurgical progress and statistical exactitude in most departments, in much that pertained to the health of the worker, white and black, evil was caused by want of thought. All that, of course, is now being changed; and prompted, perhaps, by the campaign to eradicate miners' phthisis, the movement to reduce accidents, and to diminish disease has broadened out from effort to effort until we are now within measurable distance of possessing a properly co-ordinated organisation to further the twin movements for accident prevention and disease diminution such as has been already envolved in other fields of industry. First as usual in all far-sighted movements designed to promote the welfare of the worker, the Rand Mines—Central Mining Group has been conspicuously active in recognising the importance of disease fighting, and of the directors, Mr. R. W. Schumacher, Mr. E. A. Wallers, with Mr. Samuel Evans of the Crown Mines, have been indefatigable in this direction. They have been wholeheartedly supported by the mine doctors and by Dr. Orenstein, the new Superintendent of Sanitation to the group. Some of the results of that work were indicated in the extracts from the first report of the last-named printed in our last issue, but hardly do justice to the spirit of enthusiasm and the promise of even greater success that characterise the movement. Detailed tables attached to his report, which we have not printed, show that for the mines of the Rand Mines—Central Mining Group the rates of mortality amongst the native labour force have been notably reduced. The rate of death from disease per mil. has been reduced from 20.80 for 1913, to 15.12 for 1914, the first eight months' returns of the latter being extended to reflect the mortality rate for the whole year. Similarly, in regard to deaths from accidents, the rate has been brought down from 4.5 in 1913 to 3.15 per mil. for 1914. Again, for the mines of this group the deaths from pneumonia among the native force were diminished from 9.2 per mil. in 1913 to 5.08 for 1914. In regard to native deaths from tuberculosis the rate was reduced from 3.5 per mil. in 1913, to 2.1 in 1914. Lastly, the average number of the native labour force in hospital, i.e., sick, in the eight months ended December 31, 1914, was 19.32 per mil. This compares favourably with the average number of sick in the British Navy for 1913, which was 23.79 per mil. When all allowance is made for the difficulty of making exact statistical comparisons, it must be admitted that the foregoing figures provide magnificent testimony to the success that has attended the labours of the Corner House mine doctors. A notable reference is made in Dr. Orenstein's report to the innovation introduced into native compound building at the Modder Deep, City Deep and to be introduced at the native model village at the Modder B. We hope in an early issue to give a more detailed report, illustrated by photographs, of the really notable achievement which these efforts to improve native living conditions represent. It is enough to say here that so real and material are the benefits to the health of the native compound-dwellers secured by these improvements that we cannot imagine a mining company on the Rand embarking on any new compound building scheme without adopting Dr. Orenstein's ideas. Unfortunately, the number of new compounds likely to be erected in the near future is limited. In regard to this matter, Dr. Orenstein writes:—"At the City Deep, 16 of the compound rooms, with a capacity of over 600 boys, have been equipped with individual partitioned-off bunks. The new compound at the Modder Deep (Goerz & Co.) has been equipped on the cubicle system, after designs prepared, with your kind permission, by me. The provision of individual bunks is an important step in the right direction. I am convinced that the installation of individual bunks would result in a considerable reduction in morbidity and mortality. Plans for a native village of 120 two-room cottages at the Modderfontein B. have been worked out, and the construction will be taken in hand forthwith." Further, with reference to sterilisation of water, he says:—"A small series of enteric fever cases having occurred on the New Modder and Modder B., it was decided to sterilise all water used underground on both these properties. Hypochloride sterilisation plants have been devised and were put in operation during the month of September. Since then several bacteriological examinations of the water have shown it to be equal in quality, from the bacteriological point of view, to the best potable waters. Enteric fever has disappeared on both these mines." A feature of the figures already quoted is that they show that the Superintendent of Sanitation of this group includes the prevention of accidents within his sphere. The fact is significant, and encourages us to hope that the industry in general will link up these hitherto separate activities for the greater benefit of both. The result should further crown with success the far-seeing efforts of the directors and medical men concerned.

UNION FINANCES AND THE WAR.

At the coming session of Parliament General Smuts will doubtless follow Mr. Lloyd George's example, and review the financial position of the Union at this critical stage of the war. Increased income tax, railway rates, and mining profits tax are all understood to be our certain portion, and the knowledge that they are special imposts, to end with the war, is the only relieving feature of the outlook. Doubtless to awaken us all to the need for new taxation, a detailed analysis of the finance accounts of the Union for the ten months ending January 31st was published in the *Government Gazette* of last week. The statement may be taken as the last that will be issued before the meeting of Parliament, and though the detailed revenue returns are not yet available, it is possible to gain an idea of the position at the close of the financial year. Directly and indirectly both the revenue and expenditure sides of the Budget estimates have been seriously affected. The war and the rebellion have had a devastating effect on both sides of the account. Whereas a total revenue of £16,539,000 was anticipated, the actual receipts for the twelve months will probably fall short of this sum by not less than two and a quarter million pounds sterling. The Customs and Excise revenue for the ten months has fallen short of the due proportion of the estimate by nearly a million sterling. Postal revenue has yielded some £200,000 less than the quota, and from other sources, grouped generally under "Inland Revenue," the shortage on the estimate up to date is £2,707,000. In the latter case, however, the remaining two months of the year, with their heavy contributions from mines, income tax, and other sources,' should substantially improve the position. On the expenditure side of the account it seems clear that, while serious endeavours have been made to curtail the normal issues to the lowest possible figure, these efforts have been largely neutralised by abnormal expenditure. An ultimate saving, however, on ordinary current expenditure is expected of a quarter of a million, against which must be set additional charges consequent on the Imperial Government's loan of £7,000,000 at 4½ per cent., and temporary loans issued during the past few months. The final balance sheet is expected to work out approximately as follows:—Revenue, £14,388,000; expenditure, £16,650,000; deficit, £2,250,000. This is on the understanding that revenue receives full credit for the Bewaarplaatsen Funds, which in the normal course would fall to be adjusted by Parliament next session, as promised by the Minister of Finance in April last. The state of the loan account also reflects the war and rebellion. It now appears that the remaining half of the seven million loan from the Imperial Government, the first half of which was paid over in October, has been placed to the credit of the Union, bringing the total receipts on loan account during the ten months to fifteen and a half millions. This sum has been applied up to date partly to paying off temporary loans in the early part of the financial year; partly to the programme of public works adopted by Parliament last session; and to the costs of the war and the rebellion. By the end of January war costs had reached the total of £4,570,693, apart from expenditure debited against current account; and the total issues on the loan account amounted at that date to £14,772,296, leaving the Government with something over three-quarters of a million sterling in hand to meet the war costs of the next two months. By the end of the financial year loan funds to finance the war will have to be found to the tune of £2,750,000, apart from the probable deficit on current account of £2,250,000. The deficit, of course, is due to the greatest crisis in the history of the modern world, and the country will begrudge no fair and reasonable impost necessary to meet it.

OUR MINERAL EXPORTS AND MINING MATERIAL IMPORTS IN 1914.

The usual monthly returns issued by the Union Customs Statistical Bureau, for December, include the preliminary returns for the whole of 1914, from which some interesting figures may be drawn. These show to July 31 that at the end of the seven months the trade statistics revealed a distinct tendency to a decline, both in imports and exports. Thus, as compared with the preceding year, imports of merchandise at the end of July showed a decrease of £1,500,000, or 7.3 per cent., and exports had fallen by over five millions, or nearly 13 per cent. It was already clear that quite apart from a state of war, the trade year would not be so successful as its predecessor. Comparing the calendar year 1914 with its predecessor, we have the following statement for the Union:—

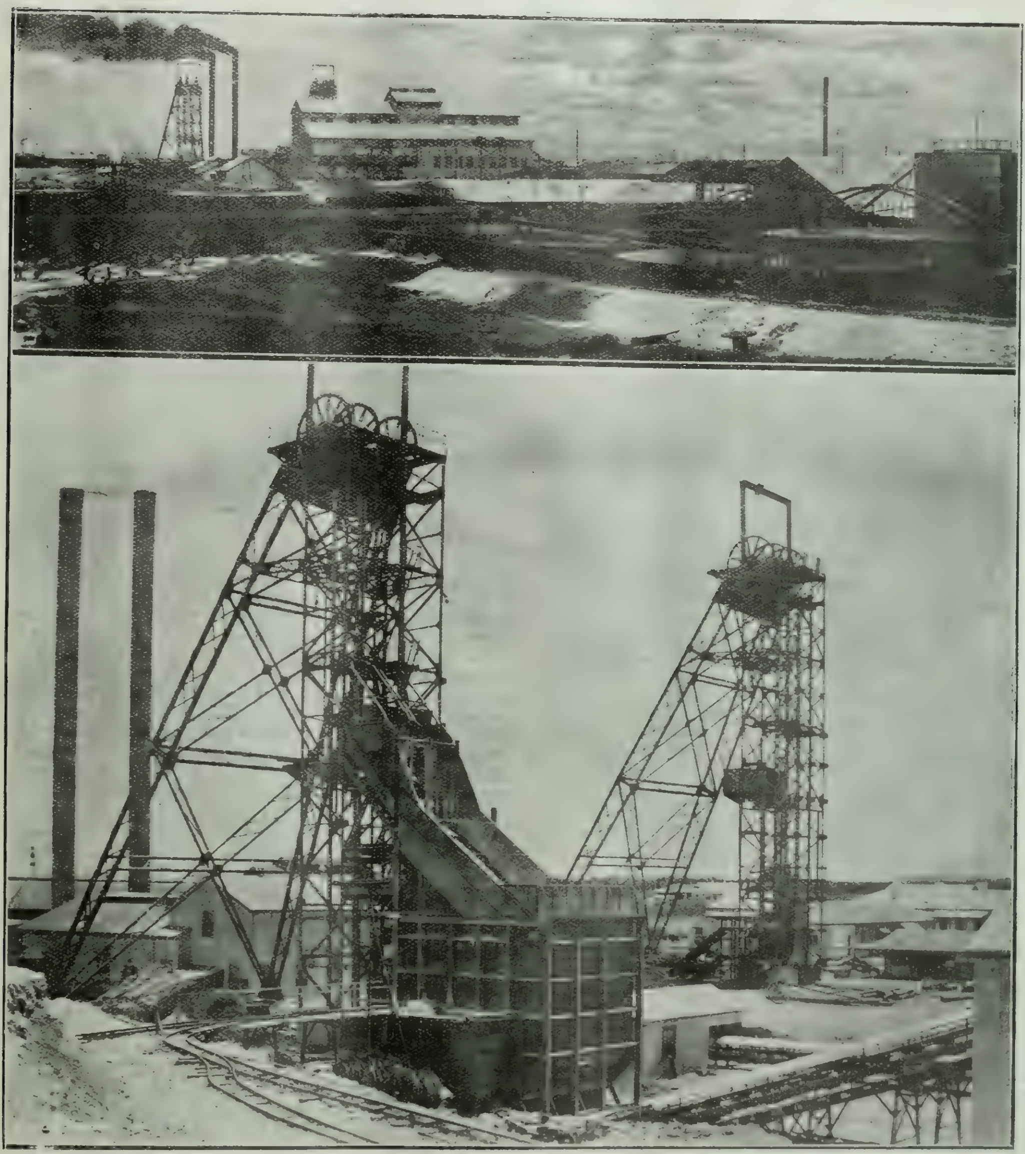
	Imports.	Exports.
1914	£36.391.861	£40.223.283
1913	42,797.077	66,659.552
Decrease	£6.408.000	£26.436.000

The figures in the above table for imports include not only merchandise, but Government importations and specie, Government importations during the year showing an increase of £730,000 on 1913. Thus, on the year 1913, the imports for 1914 show a fall of approximately 15 per cent., and the exports a fall of nearly 40 per cent. Of course, in the past few months very little gold has been shipped from the Union. Thus, whereas in 1915 we shipped gold to the value of £37,589,339, the total export of gold in 1914 was some sixteen millions sterling below that figure. Another item in which there has, of course, been an enormous decrease is diamonds. We sent diamonds to the value of £12,016,000 oversea in 1913. In the past year we sent them to a value of £5,512,000 only. Since war broke out, in fact, we have sent oversea less than half a million's worth of gold, and not £200,000 worth of diamonds. Our copper exports have been booming, not, it would appear, entirely as a consequence of the war, as exports during the first seven months of the year were unusually heavy. Tin exports also show a large increase, both in quantity and value. Turning to the imports, we find that the decrease has been spread fairly evenly over an enormous variety of commodities. The figures for the past two years may be given in some regard to many supplies:

	1914.	1913.
Drugs and Chemicals ...	£886,119	£964,591
Hardware	1.382.484	1,931.428
Iron and Steel manufactures	1,047.143	1.431.984
Leather Goods	1.406.323	1,656.407
Machinery	2,511,161	2,842,597
Motor Cars	753.725	1,100,867
Wood and Timber ...	892.784	1.233.446

On the whole, the surprising feature of the import returns is that they do not indicate a far greater disturbance than is actually the case.

THE MODDER DEEP LEVELS TO-DAY.



Modder Deep Surface Works: The top photo is a general view of the twin shaft headgears and reduction works. The bottom view shows the adjacent twin shaft headgears in greater detail.

Harmony Proprietary.

The following letter from Mines Department to the Harmony Proprietary Co., Ltd., c/o African Board of Executors and Trust Co., Ltd., P.O. Box 288, Pretoria, appears in the *Government Gazette*: Gentlemen,—Re Mynpacht No. 596, Potsdam No. 312, Harmony Proprietary Co., Ltd. In terms of Section 22 (b) of the Precious and Base Metals Act, 1908, Transvaal (Act No. 35 of 1908), I hereby demand payment at my office of the sum of £359 10s., being the amount due in respect of the above mynpacht registered in your name for the year beginning 8th August, 1914. In default of payment of this amount within three months of the first publication of this demand in the *Union Gazette*, the mynpacht will be declared cancelled.

New Lydenburg Proprietary Mines.

This company was registered on January 11 in London, with a capital of £12,500 in 5s. shares, to adopt an agreement with G. Fryer and E. F. Willcocks for the acquisition of certain gold mining claims, prospecting areas and rights near Kaapschehoop, Lydenburg district, Eastern Transvaal. Private company. The number of Directors is not to be less than three nor more than five; the subscribers are to appoint the first. Qualification, 100 shares. Solicitors, H. Dade and Co., 11 Queen Victoria Street, E.C.

POSITION OF THE PREMIER DIAMOND COMPANY.

A Record in Developed Ground—War Suspension—Floating Reef and Water Troubles—Points from Report of General Manager.

The directors of the Premier (Transvaal) Diamond Mining Co., Ltd., report for the financial year ended October 31, 1914, that the revenue and expenditure account reflects a working profit of £302,516. Owing to the war the company was compelled to suspend operations early in August last, so that mining and washing were only carried on during nine months. The production for the period ended August 10, 1914, amounted to 1,417,755 carats, a decrease of 211,732 carats, as compared with the corresponding period, and a total decrease of 690,228 carats, as compared with the previous financial year. Owing to a somewhat decreased demand, the average price of the company's diamonds shows a reduction as compared with the prices obtained during the previous year. Needless to say, hardly any sales of diamonds have been effected since the outbreak of the war. An amount of £593,074 is represented in the balance-sheet by unsold diamonds, which remain in suspense pending realisation. The dividends declared during the year were: On the preference issue—No. 19 (6s. 3d. per share) for the half-year ended April 30, 1914, paid June 8, 1914, £50,000. On the deferred issue—No. 11 (8s. 9d. per share) paid February 9, 1914, £140,000, and No. 12 (5s. per share) paid September 8, 1914, £80,000; total dividends, £270,000. The preference dividend, which is usually declared in October, does not appear in the accounts. This is the first occasion on which this item has been excluded. On June 19 last a dividend of 5s. per share on the deferred issue was declared. Owing to the cessation of diamond sales, consequent on the European War, it was decided to postpone payment. At a later date, however, after consultation and in agreement with the Government, who allowed the company to draw on the trading and emergency funds, it was decided to pay the declared dividend on the deferred issue. In regard to the dividend on the preference shares, the Government did not see their way to authorise further drawings upon the trading and emergency funds. Under the Union Income Tax Act, 1914, the company is further taxed to the extent of 1s. 6d. in the £ on its net income. The directors are of opinion that this is very unfair, and it is hoped that the Government will be able to include the company in the exemption clauses of the Act, as it originally intended to do. A conference between the various producers of diamonds was held in London during June and July last. An agreement was finally come to, which would have had a most beneficial effect on the position. Unfortunately the war intervened, and the agreement for the time being is non-effective, but there is every reason to believe that on the resumption of operations the labours of the conference will prove not to have been in vain. The report of the general manager (Mr. D. McHardy), dated November 21, 1904, says: The total number of loads of 16 cubic feet hauled from the mine is 8,253,597, accounted for as follows:—Blue ground from 260 ft. level washed, 3,949,156; blue ground from 310 ft. level washed, 2,922,311; blue ground from 360 ft. level washed, 812,476; stone and reef (discarded), 569,654. Average number of loads hauled per day of twenty-four hours, 34,390; highest number of loads hauled per day of twenty-four hours (November 17, 1913), 43,245; highest number of loads hauled per week of six days (week ended November 11, 1913), 224,378; total yield of diamonds, 1,417,755 carats; average yield per load, 0.185 carats; average cost per load mined and washed 2s. 4.009d.; average cost per carat, 12s. 7.802d.; average cost per load on total loads hauled, 2s. 2.076d. The last three figures are calculated on mine expenditure only to August 31, 1914, viz., £896,740. All mining, hauling, and washing operations ceased on August 10, when 14,000 natives were repatriated. About 300 white employees, who were unable to obtain billets elsewhere, have since been engaged in connection with the removal of the floating reef in the mine and the guarding of the property, the total amount paid out in wages under this head to October 31 being £4,825, in addition to which £550 per month is being paid to the dependents of the men who volunteered for active service. A stoppage of sixteen hours occurred on Monday, July 13, due to a large slip of ground from the original No. 3 incline embankment. The average yield for the past year was 0.185 carat per load. The development of the eastern section of the mine between the 260 ft. and 310 ft. levels exposed a considerable quantity of floating reef intermixed with the blue ground, and approximately 30 p.c. of the total quantity treated from November, 1913, to March, 1914, was drawn from this source. The average yield from April to August, when comparatively cleaner ground was being treated, was 0.193 carat per load. The increase in working costs in comparison with the previous year was entirely due to the disturbed conditions which existed in January last and to the extraordinary expenditure incurred in connection with the closing down of the mine. The development in every section of the mine is further advanced than has been the case at the close of any previous financial year. The 360 ft. level has been opened up and the quantity of ground available above this level represents 33,000,000 loads. Work in connection with the removal of the bar of floating reef has been continued, the number of loads of rock hauled being 569,654. Gradual progress has been made with the chambering of the northern portion of the bar, and arrangements were practically completed for "falling" the reef above the 160 ft. level in that section at the end of the financial year. The system outlined in the last annual report in connection with the disposal of tailings from the washing plants has worked satisfactorily, and during the period under review 7,530,000 loads of tailings have been trammed and deposited, in addition to the quantity of slimes disposed of in the usual way. The rainfall for the period under review was 19.14 in., but, notwithstanding the severe drought experienced during recent years, the water conserved in the reservoir formed by the weir across the Wilge River, has been more than sufficient for requirements. The total quantity of water pumped to the mine was 938,000,000 gallons. A plentiful supply of native labour has been available during the past year. The policy adopted in connection with the company's recruiting organisation to gradually eliminate recruiters operating on the basis of a capitation fee and to substitute agents on a monthly salary, has proved entirely satisfactory and resulted in a reduction in the expenditure hitherto incurred in obtaining native labour. The average cost of recruiting per native was 40s. 10d., compared with 55s. 4d. for the previous year. The total number of natives admitted to the compounds was 17,670, of which 5,909 came voluntarily and 11,761 were forwarded by the company's agents. Native wages amounted to £457,885 16s. 8d., being an average of 3s. 0.729d. per native per day, including piecework and overtime. The death rate from disease among the natives was 15.12 per 1,000 p.a.

Natal Coal Outputs.

The output from the collieries connected with the Natal Coal Owners' Society for the month of January, 1915, was as follows:—Dundee, 29,213 tons; Vryheid (Hlobane), 26,922; Natal Navigation, 25,638 tons; Durban Navigation, 22,739 tons; Glencoe, 14,140 tons; Hatting Spruit, 10,576 tons; Utrecht, 9,750 tons; South African, 6,374 tons; Natal Steam, 4,741 tons; Newcastle, 3,640 tons; Natal Cambrian, 2,160 tons (output restricted through a fire on the surface); Fairleigh, 2,120 tons; Elandslaagte, 1,858 tons; Ramsay, 1,221 tons; total, 161,132 tons; December output, 154,881 tons; increase, 6,251 tons.

MINING IN THE TRANSVAAL IN 1914.

Authoritative Review by the Consulting Engineer to the Central Mining Corporation—Mechanical Shovelling—Trouble with Hoists—Cyanide Works Changes.

[By H. F. Marriott.*

At the end of 1913 the outlook for the mines of the Rand for the succeeding year was better than ever before in the annals of the industry. The hard work put into details of organisation, and the improvements in methods of mining and lay-out of development during the previous few years, had slowly but surely rendered the mines more capable of regular output which could be fairly closely estimated for several years ahead. But 1914 was scarcely begun when a change in the aspect of affairs took place. In January a strike of railway employees occurred and threatened to spread to other industries and involve the whole country in a revolutionary agitation. Profiting by their experience of the previous year the Government immediately handled the situation with such energy and firmness that the revolutionary movement was quickly and effectively suppressed. The majority of the mining population proved its desire to be law-abiding by remaining at work once it was assured of adequate protection. The defection of a certain number of employees was not sufficient to do more than cause a short diminution of output, and the value of firm government was shown by the industrial peace which obtained during the remainder of the year.

TABLE I. TRANSVAAL GOLD PRODUCTION.

Year.	Witwatersrand District.			Outside Mines.	Total Value for Transvaal.
	Tons Milled.	Value.	Value per Ton Milled. Shillings.	Value.	
1884-89	1,000,000	£2,440,000	48.8	£238,231	£2,678,231
1890	730,000	1,735,491	47.4	134,154	1,869,645
1891	1,154,144	2,556,328	44.2	367,977	2,924,305
1892	1,979,354	4,297,610	43.3	243,461	4,541,071
1893 . .	2,203,704	5,187,206	47.0	293,292	5,480,498
1894	2,830,885	6,963,100	49.2	704,052	7,667,152
1895	3,456,575	7,840,779	45.2	728,776	8,569,555
1896	4,011,697	7,864,341	39.2	739,480	8,603,821
1897	5,325,355	10,583,616	39.7	1,070,109	11,653,725
1898	7,331,446	15,141,376	41.3	1,099,254	16,240,630
1899	6,872,750	15,067,173	43.8	661,220	15,728,693
1900	459,018	1,510,131	65.8	......	1,510,131
1901	412,006	1,014,687	49.2	81,364	1,096,051
1902	3,416,813	7,179,074	42.0	74,591	7,253,665
1903	6,105,016	12,146,307	39.8	442,941	12,589,248
1904	8,058,295	15,539,219	38.5	515,590	16,054,809
1905	11,160,422	19,991,658	35.8	810,416	20,802,074
1906	13,571,554	23,615,400	34.8	964,587	24,579,987
1907	15,523,229	26,421,837	34.0	981,901	27,403,738
1908	18,196,589	28,810,393	31.6	1,147,217	29,957,610
1909	20,543,759	29,900,359	29.1	1,025,429	30,925,788
1910	21,432,541	30,703,912	28.5	1,297,823	32,001,735
1911	23,888,258	33,543,479	28.1	1,498,006	35,041,485
1912	25,486,361	37,182,796	29.2	1,574,765	38,757,560
1913	25,628,432	35,812,605	27.8	1,545,435	37,358,040
1914 (est.) ...	25,873,176	34,151,183	26.4	1,444,731	35,595,914

From Table I. it will be seen that the estimates for the year show a slight increase in the tonnage milled but a decrease in the output of gold from that of the previous year. The drop in yield per ton milled was doubtless in part attributable to the fact that during the disturbed period development had to give place to the effort to sustain the tonnage output, and therefore lower-grade stopes were called on to supply more than their previous quota to the mills. No company suspended operations during the year. The Cinderella Consolidated and the Jupiter, which ceased milling in 1913, did not recommence production. The new producers were in the Eastern Rand district, and will, therefore, be referred to in detail in the section dealing with that part of the Witwatersrand. Only one company amalgamation took place during the year. It was agreed to raise the capital of the New Kleinfontein Co., Ltd., to 181,540 new £1 shares, and that that company should take over the entire concern of the Benoni Consolidated Gold Mines, Ltd., and the gold section of the Apex Mines, Ltd. Proposals for the absorption of the Robinson Gold Mining Co., Ltd., by the Crown Mines, Ltd., were brought forward but were not carried through. In contradistinction to this period of inactivity in re-arrangement of working units, however, a policy of control of much wider significance was brought to light and widely discussed. The scheme brought forward involved nothing less than the amalgamation or unification of the whole of the Rand. The matter was the subject of comment in both Government and business circles, and came before the Dominions Royal Commission during its visit to the country. But there the matter has for the time being ended. Several undertakings in the Eastern Rand progressed satisfactorily. The Van Ryn Deep declared its second dividend in June, the amount being 2s. 6d. per share as against 1s. 6d. per share declared at the end of 1913. At the end of October the Government Gold Mining Areas commenced production. Fifty stamps were first dropped, the remaining 50 being brought gradually into operation. The battery of the Modderfontein Deep Levels will be at work in 1915. The seven-compartment shaft of the Daggafontein Gold Mining Co. intersected the reef during the year at a depth of 3,580 ft. and was stopped when it reached 3,618 ft. in depth. The assay results obtained from the shaft were higher than those afforded by the boreholes. At the Springs Mines the proportion of profitable development for the second quarter of the year was given as 51 per cent., and the profitable development at the Brakpan Mines was declared as increased to 48 per cent. during the first half of the year. Development at the Geduld Proprietary Mines gave satisfactory results. During the quarter ended March 31, samples taken over 1,245 ft. gave 35·7s. over 35·2 in., and for the quarter ended June 30 the results over 1,375 ft. of development were 30·2s. over 38·1 inches. In technical matters, while no great departure was made from the usual methods, improvements and progress of a minor character were recorded. Of the various circular shafts in course of equipment that of the Crown Mines attained the greatest rate of progress. At the end of September the shaft was stopped, for the time being, at a total depth of 2,505 ft., or 69 ft. below the 16th level station. The average rate of sinking was about 150 ft. per month, and the average cost, exclusive of surface equipment, £16 2s. 11d. a foot. Mechanical shovelling machines were introduced on the Rand during the year. At the Crown Mines, in a drift 12 ft. by 10 ft., 40 carloads of two tons each were removed in 3½ hours. The Whiting hoists at the Turf Mines shaft of the Village Deep, Ltd., gave trouble at the greater depths to which they were called on to work owing to the internal strain set up in the engines by the rope coils on the reels. Their replacement by drum engines was considered, but in the meantime it was ascertained that by substituting electric power for steam and by using only one coil round the reels instead of three, the efficiency of the engines was largely increased, and they were thereafter able to cope satisfactorily with the work required to be done. The value of the method of supporting the ground above the worked-out areas by sandfilling the old stopes was again demonstrated in no uncertain fashion. A movement of ground occurred in the Village Main Reef which temporarily disabled the main hoisting shaft, and there is no doubt that, had the mine not been protected to a considerable extent by sandfilled areas, the safety of the present workings would have been seriously jeopardised. The further equipment of the Modderfontein B. Gold Mines included a battery of 16 Nissen stamps. Previously, four Nissen stamps had been at work at the City Deep and this new installation was the first material outcome of the results thus obtained on the Witwatersrand. A feature of interest in the proposed new equipment for the New Modderfontein was the reversion to single-treatment tanks in the cyanide plant design, separate collecting tanks being done away with. This was considered advisable owing to the good classification of sands and slimes now capable of attainment by means of cone classifiers. A method of overcoming the dust evil occasioned by the great tailings dumps was successfully applied in several instances during the year. Common salt is added to the slimes solution and the mixture sprayed over the surface of the dumps. The hygroscopic action of the salt keeps the coating sufficiently damp to prevent the sand from drifting.

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* Mining engineer, Central Mining and Investment Corporation, 1, London Wall Bldg., London, E.C., in the "Engineering and Mining Journal" of New York.

TABLE II. STAMPS AND TUBE MILLS.

	Stamps at Work.	Tube Mills at Work.	Duty per Stamp per Day.
1909 December	9250	148	6.8
1910 December	9150	184	7.2
1911 December	9560	244	7.9
1912 December	9410	277	8.4
1913 December	9170	78	8.7
1914 September	[illegible]	283	8.9

An important water-supply scheme was sanctioned by the Union Parliament during the year. The Rand Water Board was empowered to borrow up to £1,250,000 for the purpose of constructing an impounding reservoir and barrage across the Vaal River, and to recover contributions from the beneficiaries, the liability of the mines being 46¼ per cent. of the cost. The supply of water for the Rand from this source is estimated at 10 to 20 million gallons daily.

TABLE III. LABOUR EMPLOYED IN TRANSVAAL GOLD MINES.

	Whites	Natives.	Native Death Rate per Thousand.
1910	25,376	191,784	35.72
1911	25,108	194,286	31.01
1912	24,334	206,121	28.83
1913	22,797	162,181	[illegible]
1914—Jan.	20,715	166,817	
Mar.	21,768	177,112	
May	22,086	181,416	
July	22,324	182,469	
Sept.	22,088	183,911	19.32*

* 12 months ending September.

Interest during the year centred largely in the reports of several commissions. The first to appear was that of the Sunday Observance Commission, published in February. It recommended, amongst other things, that milling on Sunday should cease within a period of three years. The eagerly awaited report of the Economic Commission appeared in March. Closely affecting mining were the recommendations to widen the field of employment for workers other than whites, to substitute the system of day's-pay-cum-bonus in place of the contract system, the working of three shifts or the introduction of longer intervals when working two shifts, and the recognition of the principle of one day's rest in seven. The Dominions Royal Commission conducted the South African part of its enquiry during the year under review. Its third interim report, dealing with the trade of that country, was issued in London in July. Special interest attaches to it on account of the information it contains about the undeveloped areas and the so called " life " of the Rand. With regard to the mining industry, it made recommendations respecting skilled white labour, the recruiting and scope of native labour, and the relation of the Government to the industry. The report of the Select Committee on the Miners' Phthisis Act, issued in June, recommended a large increase in the compensation to be paid to Class A sufferers, the provision of a fund for helping the widows of victims, and the widening of the sphere of usefulness of the Phthisis Board. The report of Surgeon-General Gorgas, made on behalf of the mines, concerning sanitary conditions on the Witwatersrand, appeared at the end of March. It recommended an increase of floor space to about 50 square feet per individual by means of the village-hut system, with the introduction of families, a central hospital for sick natives, and the establishment of a central sanitary bureau. The abolition of the " colour bar," *i.e.*, the limitations imposed upon the usefulness of the coloured worker, was widely advocated, but no legislation to that end has yet been passed. In August, on the outbreak of the present war, the Witwatersrand gold-mining industry was faced with the problem of realization on the gold produced and the obtaining of supplies. With regard to the first, arrangements were concluded whereby a continuance of delivery of the bullion to the Bank of England is assured. With regard to the second, it was agreed between the majority of the groups to pool supplies other than the stocks actually on the mines on August 4th. The South African Mining Groups Buying Committee was formed to arrange for the continuance of supplies of the chief imports required for use by the mining industry, and succeeded satisfactorily in so doing. It may be of interest to state that the value of the stores consumed by the mines of the Witwatersrand in 1913 amounted to £10,128,800.

DIAMONDS AND BASE METALS.

The output of diamonds was stopped on account of the war, the De Beers and Premier companies closing down their mines on August 7th.

TABLE IV. DIAMOND OUTPUT

	Carats.	Gross Receipts. Total.	Gross Receipts. Per Carat.
1910	2,090,068	£1,317,715	12.6s.
1911	1,843,341	1,628,876	17.7
1912	2,131,406	2,386,979	22.4
1913	2,156,897	2,726,663	25.3
1914 (Jan. June)	895,570	860,126	19.2

The continued fall in the selling price of tin during the year brought about a restriction of operations and a diminution of output from several of the Transvaal tin fields. The shipping ore produced during the eight months ending August 31st, 1914, however, was 2,715 tons as against 2,247 tons for the corresponding period in 1913. There was a large expansion in the output of copper, 9,593 tons of shipping ore being produced during the first eight months of the year. The production for the whole of the previous year was only 5,755 tons. The Messina Copper Company was still practically the only producer of the metal in the Transvaal, and the development during the year was stated to continue to open up large quantities of high-grade ore.

The Mica Trust Scandal.

The first of the Mica Trust cases tried in London in mail week ended in a verdict against the Trust. This wretched concern, under the chairmanship of an undischarged bankrupt, Sir Kenneth Mackenzie, sent out last June a circular apparently emanating from the Consolidated Gold Fields of South. The circular offered certain shares. There was a suggestion throughout the document that these shares were being exclusively and specially offered to the shareholders in the Consolidated Gold Fields. The circular alluded to guidance from " an influential quarter " in the matter. The inference of the recipients was that the " influential quarter " was the Gold Fields offices. But the Mica Trust, it seems, meant Mr. Thomas Grimes. He was the " influential quarter." Unfortunately he cannot be found. He has gone, leaving no address. However, some of the Gold Fields shareholders fell into the trap. They applied for the shares. Through the columns of " The Financial News," the Consolidated Gold Fields at once repudiated all knowledge of the circular. Sir Kenneth Mackenzie immediately apologised to the Consolidated Gold Fields, and sent out an explanation. Meanwhile some of the applicants had stopped their cheques in time; others, not so fortunate, received notice that they were the happy possessors of Mica Trust shares, and they have now been engaged in cancelling their applications.

PROGRESS OF THE MODDER B. GOLD MINES.

Results "at a Glance" Since Commencement of Milling Operations.

The following table was attached to the paper read by Mr. H. Stuart Martin before the South African Institution of Engineers last Saturday night:—

	Period ending 31st Dec., 1911.			1912.			1913.			1914. (Provisional).			Totals and Averages.		
Tons Milled	77,960			388,570			404,580			440,000			1,311,110		
	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.
Working Revenue ...	129,818	12	2	725,219	19	6	784,428	2	10	790,139	16	6	2,429,606	11	3
Per ton milled ...		33	3		37	4		38	9		35	11		37	1
Working Expenditure ...	80,997	14	11	343,066	16	0	330,897	12	4	342,526	11	2	1,097,488	14	5
Per ton milled ...		20	9		17	8		16	4		15	7		16	9
Working Profit	48,820	17	3	382,153	3	6	453,530	10	6	447,613	5	7	1,332,117	16	10
Per ton milled ...		12	6		19	8		22	5		20	4		20	4
Net Profit	48,089	13	7	374,151	0	7	460,251	5	0	453,310	15	8	1,335,802	14	10
Dividend—Amount ...	—			140,000	0	0	315,000	0	0	385,000	0	0	840,000	0	0
Per cent. ...	—			20			45			55			120		

WORLD'S GOLD PRODUCTION IN 1914.

American Estimates—Decrease in Transvaal Figures for the First Half of the Year.

The gold production of the world in 1914, says the "Engineering and Mining Journal" of New York, again showed a reduction, although the decrease as compared with 1913 was less than the difference between that year and 1912. The total, according to the paper's preliminary figures in 1914, was $454,305,885, which is $7,364,173 less than the corrected total for 1913. The decrease from 1912 to 1914 was $20,027,883. In the table herewith, the figures for 1912 and 1913 have been corrected by official and other reports. Those for 1914 are based upon returns for eleven months, with estimates for the final months of the year from nearly all the principal countries.

Gold Production of the World.

	1912. $	1913. $	1914 $
Transvaal	188,599,260	181,889,012	173,275,610
Rhodesia	13,166,230	13,935,681	17,748,275
West Africa	7,386,028	7,846,560	8,805,000
Madagascar, etc. .	2,925,000	2,044,600	1,980,000
Total Africa ...	212,076,518	205,715,653	201,808,885
United States ...	93,451,500	88,884,400	92,823,500
Mexico	22,500,000	20,500,000	17,500,000
Canada	12,559,288	16,216,131	16,550,000
Cen. America, etc.	3,632,500	3,030,400	3,500,000
Total N. America	132,143,288	128,630,931	130,373,500
Russia, inc. Siberia	27,635,500	29,500,000	26,500,000
France	1,847,000	1,812,100	1,450,000
Other Europe ...	3,615,000	2,950,000	2,600,000
Total Europe ...	33,097,500	34,262,100	30,550,000
British India ...	12,115,162	12,176,783	12,258,000
British and Dutch Indies	4,925,000	4,739,100	4,690,000
Japan and Chosen	7,165,000	7,394,300	7,500,000
China and others ...	3,750,000	3,658,900	3,625,000
Total Asia, not including Siberia	27,955,162	27,969,083	28,073,000
South America ...	12,425,000	13,058,400	13,250,000
Australasia	56,635,800	53,033,391	51,250,000
Total for the world	474,333,268	462,669,558	455,305,385

The figures for the United States are the preliminary estimate which has been furnished by the Director of the Mint and the U.S Geological Survey. Some revision of these will be made later, but this revision is generally an upward one, the early estimates being of a conservative nature. Most of the decrease of the Transvaal was in the first half of the year. The gold production of the world for the past twenty years shows thus: 1895, $198,995,741; 1896, $211,242,081; 1897, $237,833,984; 1898, $287,327,833; 1899, $311,505,947; 1900, $258,829,703; 1901, $260,877,429; 1902, $298,812,493; 1903, $329,475,401; 1904, $349,088,293; 1905, $378,411,054; 1906, $405,551,022; 1907, $411,294,458; 1908, $443,434,527; 1909, $459,927,482; 1910, $454,213,649; 1911, $459,377,300; 1912, $474,333,268; 1913, $462,669,658; 1914, $454,305,385. The decrease in the gold production was contemporaneous with an increased demand for the metal. The usual movement was altogether upset in the latter part of the year by the general disorganisation of trade and exchange due to the war. The gold movement in the United States for eleven months ended November 30, as reported by the Division of Statistics of the Department of Commerce, shows thus: Exports, 1913, $81,226,017; 1914, $222,485,232. Imports, 1913, $58,631,475; 1914, $53,278,678; excess exports, 1913, $22,594,542; 1914, $169,206,554. The large excess of exports in 1914 was due to the payment in gold, instead of merchandise, of debts due in Europe, a notable instance being the payment in gold of New York City bonds held abroad.

A Successful Oil-Shale Industry.

Those who are hoping to build up an oil-shale industry in South Africa will be glad to hear that the total output for 1913 of the oil-shale industry of Great Britain was 3,280,143 tons, or an increase of 95,317 tons on that of the preceding year. The mineral is obtained chiefly in Edinburghshire and Linlithgowshire from seams in the Calciferous Sandstone at the base of the Carboniferous rocks. The average yield of oil is 22 gallons and of sulphate of ammonia 45 lbs. per ton of shale. Some of the seams worked are rich in oil and poor in sulphate of ammonia; in others the reverse is the case. Of the total, Flint contributed 240 tons, at an average price at the mines of 5s. 10d. per ton. The Scottish output was as follows:—Edinburgh, 723,766 tons; Lanark and Sutherland, 61,408 tons, Linlithgow, 2,494,658 tons; Stirling, 71 tons. The average price at the mine was 5s. 0'17d. per ton. The following table shows the output and value of oil shale in the United Kingdom during the past five years:

Year.	Quantity. Tons.	Value.
1909 .. .	2,967,057	£815,937
1910	3,130,280	860,827
1911 .	3,116,803	857,120
1912	3,184,826	765,730
1913	3,280,143	822,394

PROGRESS ON BARNATO MINES.

Improved Yield and Reduced Costs the Feature—Outlook for Government Areas, Consolidated Langlaagte, and Van Ryn Deep.

IN the quarter ended the 31st December the Consolidated Langlaagte Mines made a working profit of £91,198 13s. 9d., equal to 12·024s. per ton. Total costs were £105,836 8s. 5d., or 14·028s. per ton, and the revenue from gold, £197,035 2s. 2d. There was a distinct improvement in the grade of the ore milled, and the recovery value was increased by a shilling per ton as compared with the previous quarter. Working costs were slightly lower, and though there was a falling off in the quantity of ore milled to the extent of 3,200 tons, the gross profit showed the substantial increase of £7,101. In the same period the Ginsberg made a working profit of £10,420 16s. 11d., equal to 4·524s. per ton. The expenditure amounted to £39,671 4s. 11d., or 17·225s. per ton, and the revenue from gold to £50,092 1s. 10d. There was an increase of 848 tons in the quantity of ore crushed, and working costs were reduced by sixpence per ton as compared with the previous quarter. The grade was slightly lower, but notwithstanding this the gross profit was increased by £435. The Glencairn made a working profit of £6,247 2s. 11d., equal to 1·957s. per ton. Revenue from gold amounted to £42,705 8s. 11d., and the total cost to £36,458 6s., or 11·528s. per ton. The gross profit is less than that for previous quarter by £1,903. This was due to the quantity of ore milled being reduced by 1,783 tons and to a slight lowering of the grade. Working costs were practically unchanged. Government Gold Mining Areas (Modderfontein) Consolidated made a loss on working of £23,878 14s. 8d. The yield was worth £80,965 15s. 3d., or 16·574s., and the expenditure £104,844 9s. 11d., or 21·462s. per ton. Milling was commenced on the 16th October, and there were crushed during that month 12,400 tons of ore at a cost of £18,242. Owing to absorption in the new plant no gold was recovered during this month to set against the working costs. In November, 40,700 tons were crushed; working costs amounted to £42,111; absorption still went on, but gold to the value of £35,389 was recovered, so that there was a loss on the month's working of £6,722. In December, 44,600 tons were crushed at a cost of £44,491. The gold recovered amounted to £45,576, so that there was a slight profit for this month. The grade of the ore milled so far cannot be looked on as representative, as a quantity of surface dump was included, and, further, in getting a mine into working condition a considerable amount of waste is unavoidably mined. A steady improvement in results may now be looked for, and this improvement should continue till a normal profit corresponding to the grade of the mine, and the present scale of working, is attained. Development continues to open up ore of satisfactory grade. A connection between the southern shafts was established in November, so that both the northern and southern sections of the mine are now adequately ventilated; and there is now no restriction to mining in either section. The reduction plant has proved entirely satisfactory, and is quite capable of treating the tonnage for which it was designed. The New Primrose made a working profit of £25,669 17s. 4d., or 7·720s. per ton. Revenue from gold amounted to £68,299 0s. 2d. and expenditure to £42,629 2s. 10d., or 12·821s. per ton. There was a reduction of 2,900 tons in the quantity of ore crushed as compared with the previous quarter. Working costs were slightly higher, and the grade fell away to the extent of 1·82 shillings per ton. The drop in grade was in part due to the fact that a fall of ground made it impossible to work the diagonal shaft section of the mine during the quarter. This section will, however, be available again at an early date. The accumulated slime is almost exhausted, so that very little was treated, and the revenue from this source was also reduced. As a result the gross profit was less than that for the preceding three months by £8,513. The development of the southern series has recently exposed more promising values, and the ore reserves have benefited accordingly. At the New Rietfontein gold was recovered to the value of £18,630 11s. 5d. Fluctuations in grade were more pronounced than usual during the past three months, and as the mine has been working on a very narrow margin any adverse factor which arises has a considerable effect on results. During October the grade fell below the pay limit, and the loss for the month amounted to £892. There was a slight improvement during November and December, and a small profit was made for these months, so that the loss for the quarter was reduced to £246. A small amount of development is being done, with varying results. Of the ore milled, 14,891 tons were obtained from reclamation. A working profit of £15,104 7s. 2d. was made at the New Unified, equal to 7·512s. per ton. The revenue from gold was £40,344 16s. 8d., and the expenditure £25,240 9s. 6d., or 12.555s. per ton. The profit was made for these months, so that the loss for the quarter was reduced to £246. A small amount of development is being done, with varying results. Of the ore milled, 14,801 tons were obtained from reclamation. A working profit of £15,104 7s. 2d. was made at the New Unified, equal to 7.512s. per ton. The revenue from gold was £40,344 16s. 8d., and the expenditure £25,240 9s. 6d., or 12.555s. per ton. The gross profit realised was practically the same as that for the previous quarter. Working costs were reduced by 10d. per ton, and there was a somewhat similar reduction in grade. The proportion of main reef mined has been steadily increased, and for December it amounted to 58.5 per cent. This is a higher percentage than would be worked normally, but there has been a slight shortage of boys on the mine, and this reef is more easily mined than the main reef leader or south reef. Though its grade is low it can be worked cheaply, and leaves a fair margin of profit. The development of the south reef was actively proceeded with, and the results have been of a satisfactory nature. At the Van Ryn Deep the working profit was £118,738 15s. 4d., equal to 18.885s. per ton; the revenue from gold being £217,075 13s. 4d., and the expenditure £98,336 18s., or 15.640s. per ton. The quantity of ore milled was less than that for the previous quarter by 3,150 tons. This had a tendency to increase the working costs per ton, but on the other hand the grade showed a marked improvement, the recovery value being 1.792s. per ton higher than that for the preceding three months, and the gross profit was increased by £6,117. At the Witwatersrand the working profit for the quarter was £70,259 8s., equal to 11.082s. per ton. The revenue from gold were £156,568 9s. 3d., and the expenditure £86,309 1s. 3d., or 13.613s. per ton. The tonnage crushed was less than that for the previous quarter by 7,460 tons. The grade showed an improvement of 1s. 4d. per ton, but as working costs were increased by over 10d. per ton the total gross profit was very little effected, it being only £878 less than that for the preceding three months.

The Analysis of Mining Explosives.

A technical paper has been issued by the United States Bureau of Mines dealing with specific-gravity separation applied to the analysis of mining explosives (C. G. Storm and A. L. Hyde). A purely chemical analysis is entirely inadequate for many explosive compounds, particularly coal mining explosives; for example, if the water extract of an explosive is found to contain both a nitrate and a chloride combined with sodium and ammonium, it is impossible to ascertain by chemical analysis the exact manner of combination of the ions. This difficulty has suggested the possibility of making a qualitative, if not a quantitative, analysis of such mixtures by the use of liquids of such specific gravities that certain of the components would sink and others float when mixed with these liquids. It has been found difficult to obtain quantitative results where carbonaceous constituents such as wood pulp, wheat flour, or cornmeal have been present, but tests show that the method is often of much value in giving a qualitative analysis showing what salts are present, and in supplying a rough quantitative separation. As liquids mixtures of bromoform and chloroform were found to be particularly suitable, as these liquids provide a wide range of specific gravity (2.83—1.49), and are miscible in all proportions, whereas the specific gravity of most of the salts used in mining explosives lies between 1.50 and 2.50.

Mine Safety and Sanitation Notes.

SAFEGUARDING THE USE OF MINING MACHINERY.[*]

[By Frank H. Kneeland.

Safety First is a popular motto—most mining companies have adopted it. It is probable, however, that in the majority of cases it is only a motto and gets no further than the office stationery or the bulletin board at the mine's entrance. In but few industries is there employed a greater diversity of machinery and mechanical devices than in mining. The list ranges all the way from mechanical stokers to woodworking machinery and undercutters. Many of these devices, particularly those employed in wood working, are extremely dangerous. In 1913, 23 per cent. of all fatalities occurring in coal mining in the U.S. were caused by machinery of some sort or other. Although the forms of accidents occurring with mining machinery are legion, they generally arise from one or more of five causes: (a) Falls from ladders, platforms, etc.; (b) coming in contact with moving machines or parts thereof; (c) electric shocks; (d) failure of some machine part; (e) mismanipulation of valves, levers, switches or other hand-operated controlling devices. The steps which may be taken to prevent accidents from the above causes are almost as numerous as the accidents themselves. There is, and can be, no panacea for all mishaps, nor for any one class of accidents. There is no mathematical or other formula that will bring immunity under any set of conditions. Common sense is the only guide. The remedy for the first-named class of accidents is simple and generally effective—namely, make the staging, ladder platform, or other support, abundantly strong to carry any possible weight that it may be called upon to bear; provide ample railings on platforms or runways, and non-slipping feet on movable ladders. Coming in contact with moving machine parts is one of the greatest dangers met with in the operation and maintenance of mining machinery. Unfortunately, machine manufacturers have not as a class adopted the idea of thoroughly protecting and incasing the dangerous parts of their product. No one has, or should have, a better or more thorough knowledge of what the dangerous parts or elements of a machine may be than its builder. The desire to construct a piece of mechanism as cheaply as possible impels many manufacturers to forego making the machines as safe as possible. An exposed train of gears, an unprotected revolving bolt head, setscrew, feather or spline, an open keyway on a shaft, and the like, are all well-recognized dangers. Yet few indeed are the machines where these are all absent. The means to be employed to prevent accidents from these causes are two in number: First, eliminate so far as possible angular projections on revolving or moving parts; *e.g.*, replace ordinary squarehead setscrews with those of the hollow variety which screw down flush. Second, guard or protect the moving parts of the machine. When purchasing new equipment many firms specify something like the following: All angular moving parts or projections must be avoided as far as possible. If impossible to avoid their use, all gears, cams, eccentrics, setscrews, bolts, sprockets, chains, belts, feathers, splines, keyways, cranks, connecting rods, or other dangerous revolving or moving parts actuated by power, must be so guarded and protected as to render contact, intentional or otherwise, between them and the anatomy or clothing of the attendant as nearly impossible as the work to be performed will permit. All guards must be so constructed and built up as to be readily removable without the use of special tools, allowing ready access to the working parts for inspection or repair. It must be the aim of the builder to produce a machine that shall be as safe to handle and operate as human ingenuity can devise and the work in hand will permit, and no bid will be considered unless detailed plans are submitted which shall meet the entire approval of our engineers and safety experts. But many machines are at present in use which represent too great an investment to be discarded. To render these machines even reasonably safe, adequate guards are necessary. These guards may be of many descriptions, but in general their object is to render an accident impossible. This is, however, out of the question, since the human element is an unknown quantity, and while it may be possible to make a machine foolproof, it is difficult to render it impregnable against suicidal intentions. Several different materials may be employed with fairly good success. Wooden fences or boxes are in general the cheapest in first cost, but are obviously open to many objections. Hand railings and the like made of small structural shapes are, generally speaking, equally efficient and far more permanent than their wooden counterparts. Wire mesh of suitable weight, properly stiffened with structural-shape frames, so constructed as to be easily separated into sections, is one of the most efficient and permanent of all guards. Recently, expanded metal has been introduced in lieu of wire mesh and appears to be admirably adapted to guarding purposes. Generally speaking, an air gap of sufficient width is a certain protection against dangerous electric shocks. While insulation gives supposed immunity, the only safe method of procedure is to treat every electrical conductor, regardless of covering or supposed voltage, with the same respect that would be given were it known to carry a large amperage at high potential. Although underground circuits at American mines usually carry direct current of a voltage not exceeding 500, yet we not infrequently hear of men being injured or killed through forming a short circuit between trolley and rail. Trolley wires may be protected from accidental contact by comparatively simple means. The trolley guard board, and its means of suspension, are well known and need no further comment. Such protection should assuredly be placed at points of danger, particularly where men pass under the wire, and at other places where observation would indicate that accidents might occur. A point of danger which exists at many mine plants, and one which is perhaps not generally recognied, is the space behind switchboards, particularly those carrying high-tension conductors or making high-tension connections. Such places, regardless of whether the current carried is direct or alternating, or whether the voltage is 110 or 110,000, should be effectually fenced in, and no one should be allowed behind the switchboard while current is on. The failure of machine parts is the least probable of all accidents, but one of the most difficult to forestall. It is practically impossible to determine the existence of a faulty weld in a steam pipe, or a cold shut in a casing. Both may withstand a test pressure yet fail in service through the fatigue of materials. It is well in designing a plant to provide good means of egress from the vicinity of all pipes carrying a high pressure of steam, air, or hot water since the greatest danger from their failure is not so much from flying pieces as from the fluid released. In certain instances, breaking machine parts, dangerous in themselves, may be rendered harmless by proper means. The best known of such devices, although not the only ones, are gauge glass protectors on boilers and safety collars on emery wheels. Mismanipulation of hand-operated controlling devices is a prolific cause of accident, of which the overwind is perhaps the best known example in mining experience. Another type of apparatus which causes many deaths annually is the electric switch, which if thrown while a man is making repairs to the line it controls introduces an extreme hazard to the repairman. Boiler washers while at work are sometimes killed through the opening of some valve connecting to another boiler or to the feed pump.

(*To be continued.*)

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[*] Paper read before the A.I.M.E.

Correspondence and Discussion.

Comments on Questions Arising in Technical Practice or Suggested by Articles in the Journal—Views, Suggestions and Experiences of Readers.

Metal Guides for Stamps.

To the Editor, *South African Mining Journal.*

Sir,—Some friends of mine who are starting a small proposition have requested me to obtain particulars of metal guides for stamps. The only one I know is the Simplex. May I trespass on your good nature for the names of any others and the firms who deal in them, so that I may obtain particulars for the purposes of comparison. Thanking you in anticipation for the favour of a reply.—Yours, etc.,

EDW. HEMING.

Benoni, February 14th, 1915.

[Perhaps some of our readers may oblige.—Ed.]

Increased British Taxes.

To the Editor, *South African Mining Journal.*

Sir,—By the Finance Act, 1914 (Session 2), British income tax has been increased by one-third for 1914-15, and for 1915-16 the rate is to be doubled. All persons having income subjected to British income tax will have to suffer this increased rate. In many cases, however, a considerable rebate from the full rate can be obtained, as, irrespective of the total, certain classes of income are entirely exempted from the tax, and in the case of a person who is or has been in the service of the Crown or any Native State under the Protectorate of the Crown, or is in the employ of a Missionary Society, or is resident abroad for the purpose of health, a rebate is allowed when the total income does not exceed £700. If advantage can be, and is, taken of the exemption or abatement the virtual rate of tax is considerably reduced, and is in many cases quite nominal. Relief can only be obtained by claiming repayment of the tax deducted, and as there is a time limit within which claims can be made the matter is one calling for immediate attention. At the present time a claim for repayment for four years can be made, but after the 5th April next only claims for three years will be admitted.—Yours, etc.,

For the Tax Adjustment Agency,

E. MONTAGUE.

386, Oxford Street, London, England,
January, 1915.

New Steyn Estate.

The following letter from the Mining Commissioner to the Secretary, New Steyn Estate Gold Mines, Ltd., P.O. Box 1173, Johannesburg, appears in the current issue of the *Government Gazette*:—In accordance with the provisions of Sub-section (1) of Section 102 of the Precious and Base Metals Act, 1908, of the Transvaal (Act No. 35 of 1908), I have the honour to give you notice that the licence moneys in respect of Claims Nos. 5010-5095, Bezitrecht No. 1383, held under Prospecting Licence No. 1184, situate on the farm Doornkop No. 46 (freehold owners, New Steyn Estate Gold Mines, Ltd.), in the mining district of Krugersdorp, registered in the name of your company, are more than six months in arrear, and I therefore hereby demand payment of all licences due thereon together with fines and costs of publication of this notice. In default of payment of the licences, fines, and costs, within three months of the first publication of this demand according to law, the claims will lapse as provided in Sub-section (4) of Section 102 of the said Act No. 35 of 1908.

Rhodesian Section.

LATEST MINING NEWS.

Bell Reef Development—Globe and Phoenix Ore Reserves

In one respect only was there improvement during December at the Bell Reef Development. The yield rose 1s. 1d. per ton, to 47s., which about represents the value of the ore reserves. Ore crushed declined 174 tons, while costs rose by 1s. 4d. per ton, to 37s. 2d. The growth in expenses in the last four months is very disappointing. Mr. Piper expected to be able to work (when treating 4,000 tons monthly) at a ratio of 25s. Below we analyse the returns for the past six months:—

	Tons.	Yield.	Per Ton.	Costs per Ton.	Profit.	Per Ton
July	3,490	£7,629	43/8	32/-	£2,027	11/8
August ...	3,684	6,669	36/3	28/11	1,346	7/4
September..	3,549	6,362	35/11	31/4	814	4/7
October ...	3,200	7,491	46/10	34/-	2,059	12/10
November..	3,200	7,342	45/11	35/10	1,612	10/1
December..	3,026	7,106	47/-	37/2	1,482	9/10

Excessive rains have resulted in the holding up of fuel supplies, with the consequence that milling has had to be stopped, and the manager is at present unable to say when it can be re-started.

An increase in tonnage as well as in average value is disclosed by the ore reserves estimate issued recently by the Globe and Phoenix Gold Mining Company. In the following table we give the latest figures, together with those issued three months and twelve months ago:—

	End Dec. 1914.	End Sept. 1914.	End Dec. 1913.
Payable ore reserves (tons)	194,400	188,000	180,757
Average value per ton (dwts.)	29·5	29·1	27·2
Gold contents (ozs.) ...	286,740	273,540	245,829
Gross value	£1,204,308	£1,148,868	£1,032,481

The latest official circular also states that "in addition to the above there are on hand, at 31st December, accumulated sands, slimes, concentrates and residues as previously reported." At the end of June these additions were calculated to amount to 278,783 tons and the estimate of profit on them was £143,000.

RHODESIA'S CHIEF GOLD PRODUCERS.

The following table shows the value of each month's output of Rhodesia since Jan., 1910 :—

	1910.	1911.	1912.	1913.	1914.
Jan.	£227,508	£207,903	£214,918	£220,776	£249,032
Feb.	203,888	203,055	209,744	208,744	259,883
Mar.	228,385	231,947	215,102	257,797	273,236
April	223,213	221,296	221,476	241,098	296,907
May	224,886	211,413	234,407	242,452	290,062
June	214,709	215,347	226,867	241,303	306,421
July	195,233	237,516	240,514	249,301	320,670
Aug.	191,423	243,712	239,077	250,576	316,972
Sept.	178,950	225,777	230,573	250,429	309,393
Oct.	234,928	218,862	230,072	247,068	337,241
Nov.	240,573	214,040	225,957	239,036	311,711
Dec.	199,500	217,026	218,661	254,687	309,669
	£2,568,198	£2,647,894	£2,707,368	£2,903,267	£3,580,207

The following are the returns of the principal gold producers in Rhodesia for the past six months. The details include the tonnage milled, yield, cost, and profit :

	Tons milled.	Yield Total £	Yield per ton.	Total Cost £	Cost per ton.	Total Profit £	Profit per ton.
ANTELOPE (Capital £400,000 in 5/- shares ; issued, £348,282) :—							
July	4,235	9,806	46/4	6,872	32/6	2,933	13/10
Aug.	4,081	9,926	48/8	6,571	32/3	3,355	16/5
Sept.	3,948	8,964	45/5	6,349	32/2	2,615	13/3
Oct.	3,377	7,551	44/9	6,076	36/-	1,475	8/9
Nov.	3,762	8,800	46/10	6,327	33/8	2,473	13/2
Dec.	3,668	8,194	44/8	6,537	35/8	1,657	9/
BELL REEF DEV. (Capital £200,000 ; issued, £181,338) :—							
July	3,490	7,620	43/8	5,602	32/-	2,027	11/8
Aug.	3,684	6,669	36/3	5,323	28/11	1,346	7/4
Sept.	3,549	6,362	35/11	5,548	31/4	814	4/7
Oct.	3,200	7,491	46/10	5,432	34/-	2,059	12/10
Nov.	3,200	7,342	45/11	5,730	35/10	1,612	10/1
Dec.	3,026	7,106	47/-	5,624	37/2	1,482	9/10
CAM & MOTOR (Capital £517,000 ; issued, £492,500) :—							
July	12,234	15,867	26/-	—	—	—	—
Aug.	11,997	16,210	27/-	—	—	—	—
Sept.	11,870	16,709	28/2	—	—	—	—
Oct.	12,435	17,109	27/6	—	—	—	—
Nov.	11,748	17,503	29/10	—	—	—	—
Dec.	10,805	17,821	32/9	—	—	—	—
CHARTERLAND & GENERAL EXPLORATION (Old Nic Mine.)							
July	1,310	2,259	34/6	2,356	36/-	*97	*1/6
Aug.	2,130	4,028	37/10	2,833	26/7	1,195	11/3
Sept.	2,513	2,981	23/9	2,905	23/2	76	/7
Oct.	2,764	5,120	37/1	3,372	24/5	1,748	12/8
Nov.	—	3,871	—	3,136	—	739	—
Dec.	—	3,647	—	3,101	—	546	—
* Loss.							
EILEEN ALANNAH (Capital £500,000 ; issued, £410,000) :—							
June	2,047	4,171	40/9	—	—	—	—
July	2,162	4,164	38/6	—	—	—	—
Aug.	2,087	4,267	40/11	—	—	—	—
Sept.	1,827	3,952	43/3	—	—	—	—
Oct.	1,835	3,695	40/3	—	—	—	—
ELDORADO BANKET (Capital £300,000) :—							
July	4,979	9,968	40/-	5,671	22/9	4,297	17/3
Aug.	5,243	10,847	41/4	5,683	21/8	5,164	19/8
Sept.	5,249	10,573	40/3	5,841	22/3	4,732	18
Oct.	5,228	11,123	42/7	6,151	23/7	4,972	19/-
Nov.	5,413	18,052	66/8	6,009	22/2	12,043	44/6
Dec.	4,095	11,229	54/10	6,035	29/6	5,194	25/4

Reserve gold, oz. :—1914 : July, 2,861 ; Aug., 2,861 ; Oct., 2,501 ; Dec., 3,201.

Recent dividends—1912 : June, 15% ; Dec., 15%. 1913 : June, 15% ; Dec., 15%. 1914 : June, 10% ; Dec., 7½%.

GAIKA (Capital £300,000) :—							
July	3,386	7,389	43/8	4,188	24/9	3,201	18/11
Aug.	3,330	7,556	45/4	4,227	25/4	3,326	20/-
Sept.	3,388	7,160	42/3	4,264	25/1	2,906	17/2
Oct.	3,000	7,476	49/10	4,046	27/-	3,430	22/10
Nov.	3,151	7,072	44/10	4,102	26/-	2,970	18/10
Dec.	3,091	7,086	45/10	4,249	27/6	2,837	18/4

Reserve gold, oz. :— Mar., 1,027.

Recent dividends—1912 : Oct., 5%. 1914 : Jan., 5% ; June, 5%.

GIANT (Capital £262,500 ; issued, £269,745) :							
July	4,290	3,680	17	3,380	16/1	200	/11
Aug.	3,820	3,630	19	3,047	15/11	583	3/1
Sept.	5,300	4,526	17/1	4,126	15/7	400	1/6
Oct.	6,000	4,392	14/8	3,980	13/3	412	1/5
Nov.	4,500	—	—	—	—	590	2/7
Dec.	5,088	3,772	14/10	3,177	12/6	595	2/4

Recent dividends—1912 : Mar., 10% ; June, 10% ; Sept., 10% ; Dec., 6¼%. 1913 : Mar., 5%

	Tons milled.	Total Yield £	Yield per ton.	Total Yield £	Cost per ton.	Total Yield £	Profit per ton.
GLOBE AND PHŒNIX (Capital £200,000 in 5/- shares) :—							
July	6,037	40,619	134/7	14,619	48/5	26,000	86/2
Aug.	6,094	41,588	136/6	14,588	47/11	27,000	88/7
Sept.	6,104	40,382	132/3	13,382	43/10	27,000	88/5
Oct.	6,014	43,305	144/-	16,305	54/3	27,000	89/9
Nov.	—	—	—	—	—	29,489	—
Dec.	5,837	43,586	149/4	15,136	51/10	28,450	97/6

Reserve gold, oz. :—1914 : Mar., 803 ; April, nil ; Aug., £3,500 ; Sept., £4,961 ; Oct., £7,348.

Recent dividends—1912 : Mar., 40% ; June, 35% ; Oct., 35% ; 1913 : Jan., 35% ; April, 35% ; July, 35% ; Oct., 35%. 1914 : Jan., 1/- ; Mar., 1/9 ; June, 1/6 ; Oct., 1/6. 1915 : Jan., 1/6

JUMBO (Capital £380,000) :—							
July	3,300	3,876	23/6	—		—	—
Aug.	2,640	3,048	23/4	—	—	—	—
Sept.	2,050	2,258	22/-	—	—	—	—
Oct.	2,260	2,523	22/4	—	—	—	—
KIMBERLEY (MASHONALAND) (Capital, £300,000) :—							
July	4,800	6,540	27/-	4,170	17/3	2,370	9/9
Aug.	5,200	7,772	29/11	4,420	17/-	3,352	12/11
Sept.	4,950	7,773	31/5	4,451	18/-	3,322	13/5
Oct.	5,000	7,163	28/8	4,600	18/6	2,583	10/3
Dec.	4,700	7,059	30/-	—	—	—	—
LONELY REEF (Capital, £325,000 ; issued, £271,000) :—							
July	5,540	17,180	60/-	8,280	29/11	8,900	32/1
Aug.	6,090	16,800	55/2	8,500	27/11	8,300	27/3
Sept.	4,640	13,425	57/10	8,000	34/6	5,425	23/4
Oct.	4,030	11,127	55/3	7,250	36/-	3,877	19/3
Nov.	3,110	10,870	69/11	6,800	43/9	4,070	26/2
Dec.	4,500	13,462	59/10	7,000	30/1	6,462	28/9

Recent dividends—1912 : April, 2/- ; Sept., 2/- ; 1913 : Jan., 2/- ; May, 2/- ; Sept., 2/- ; 1914 : Jan., 2/- ; May, 2/-. 1915 : Jan., 2/-

MATABELE QUEENS (Capital, £250,000, in 10/- shares ; issued, 360,000 shares) :—							
July	1,830	2,590	28/4	—	—	—	—
Aug.	1,880	3,269	34/9	—	—	—	—
Sept.	1,715	4,047	47/2	—	—	—	—
Oct.	1,780	3,954	44/6	—	—	—	—
REZENDE (Capital, £120,000 ; issued, £118,435) :—							
July	4,800	*7,097	29/7	4,937	20/7	*2,160	9/-
Aug.	4,500	*6,965	30/11	4,828	21/5	*2,137	9/6
Sept.	4,500	*6,839	30/5	4,819	21/5	*2,020	9/-
Oct.	—	—	—	—	—	†3,042	—
Nov.	4,400	*6,664	30/3	4,579	20/10	*2,085	9/6

*Additional profit from old west workings.—1914 : Mar., £644 ; Apl., £453 ; May, £815 ; June, £855 ; July, £853 ; Aug., £751 ; Sept., £794 ; Nov., £491. † Total profit including Penhalonga section.

(CENTRAL SECTION.)							
Dec.	4,500	6,657	29/7	4,653	20/8	2,004	8/1
(OLD WEST SECTION)							
Dec.	4,500	2,303	10/3	1,667	7/6	636	2/10
(PENHALONGA SECTION).							
July	9,500	1,580	3/4	1,715	3/7	†135	†/3
Aug.	7,400	1,812	4/10	1,614	4/4	198	/6
Sept.	6,700	1,931	5/9	1,687	5/-	244	/9
Nov.	2,700	1,021	7/6	1,040	7/8	†19	†/2

Dividends—1912 : December, 1/6. 1913 : May, 1/6 ; Oct., 1/6 ; 1914 : May, 1/6 ; Sept., 1/3 † Loss.

SHAMVA MINES (Capital, £600,000) :—							
July	50,622	38,455	15/2	19,861	7/10	18,604	7/4
Aug.	47,718	31,283	13/1	18,160	7/7	13,123	5/6
Sept.	27,792	17,712	12/9	14,689	10/7	3,014	2/2
Oct.	48,489	31,348	12/11	18,446	7/7	12,902	5/4
Nov.	41,781	27,081	12/11	16,761	8/-	10,320	4/11
Dec.	50,451	29,244	11/7	17,271	6/10	11,973	4/9
THISTLE ETNA (Capital, £125,000 ; issued, £90,000) :—							
July	2,586	3,727	28/10	2,970	23/-	757	5/10
Aug.	3,120	3,865	24/9	2,756	17/8	1,109	7/1
Sept.	2,800	3,258	23/3	2,803	20/-	455	3/3
Oct.	2,132	3,359	31/6	2,678	25/1	681	6/5
Nov.	2,382	2,954	24/10	2,190	18/6	764	6/5
Dec.	2,520	2,813	22/4	2,302	18/3	516	4/1
TRANSVAAL AND RHODESIAN ESTATES (Capital £1,000,000 in 4/- shares ; issued, 2,910,537 shares) :—							
(FRED MINE.)							
July	1,700	5,000	58/10	—	—	—	—
Aug.	1,800	5,200	57/9	—	—	—	—
Sept.	1,950	6,200	63/7	—	—	—	—
Oct.	2,030	6,100	59/6	—	—	—	—
Nov.	1,950	6,000	61/6	—	—	—	—
Dec. 27	—	5,650	—	—	—	—	—
WANDERER (Capital, £150,000 in 5/- shares ; issued, 565,393 shares) :—							
July	*11,532	6,884	12/-	3,928	6/10	2,956	5/2
Aug.	*11,020	5,986	10/10	4,005	7/3	1,981	3/7
Sept.	*12,160	6,284	10/4	3,908	6/5	2,376	3/11
Oct.	*12,160	6,089	10/-	4,186	6/11	1,906	3/1
Nov.	*11,210	5,226	9/4	3,888	7/1	1,360	2/3
Dec.	*11,020	5,364	9/9	4,196	7/8	1,168	2/1

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Engineering Notes and News.

Port Elizabeth Electricity Extension Scheme.

MODERN NEW PLANT ORDERED.

The Municipality of the City of Port Elizabeth is now proceeding with their scheme for extending the supply of electrical energy throughout the Municipality, and they have just ordered a complete new plant. This plant embodies all the latest improvements in modern engineering practice, and will be the most up-to-date of its kind in South Africa. The generators consist of 2-1000 K.W. Turbo Alternator sets, the steam turbines being of the high pressure type, built by Messrs. Fraser & Chalmers, Ltd., of London and Johannesburg. These turbines will drive alternators made by Messrs. Dick Kerr & Co., and they will be complete with surface condensing plants with the auxiliaries driven by small steam turbines, which is the very latest practice in England and America. Fraser & Chalmers are the main contractors for the whole of the generating plant, and will be responsible for the installation and preliminary running of these two sets at Port Elizabeth. The 500 K.W. motor converter set has been ordered from Messrs. Bruce Peebles and Co., and the contract for the supply of switch gear has been entrusted to the British Thomson Houston Co. In addition to these generating units the Corporation is extending its boiler plant by the addition of two units. At the same time they are installing a plant to mechanically handle coal and ashes. The whole of the new installation will be of British manufacture throughout. The installation of the new plant will be under the direct control of the Port Elizabeth city electrical engineer, Mr. Bernard Sankey, M.I.E.E.

Tenders Invited.

The Municipal Council of Johannesburg invite tenders for the supply of the following:—(a) Spare parts for B. & W. boilers, stokers, and ash conveyors—Contract No. 954; (b) fluid disinfectant—Contract No. 955; (c) graphite—Contract No. 956; (d) horse shoe bar iron, horse shoe nails, and horse rasps—Contract No. 959; (e) uniforms for tramway officials—Contract No. 960; (f) overcoats for tramway officials—Contract No. 961; (g) uniforms for sanitary inspectors and overseers—Contract No. 962; (h) uniforms for natives—Contract No. 963. Forms of tender may be had on application. Sealed tenders, which must be placed in the Tender Box, Municipal Offices, will be received by the Town Clerk, up to noon on Tuesday, 27th April, 1915, in respect of (b), (c), (d), (e), (f) and (h), and noon on Friday, 5th March, in respect of (a) and (g).

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THE LAY-OUT AND UNDERGROUND ORE TRANSPORT OF THE MODDER B.

A Detailed Description of the General Lay-out of the Mine, with Particular Reference to the Methods Adopted for the Transport of Ore Underground.

[By H. Stuart Martin.]*

The author was prompted to write this paper because, in the first place, the Council was disappointed in not having a paper for the February Journal and, secondly, because there had been from time to time considerable discussion as to the wisdom of laying out a gold mine, as in this instance, on the large block system, with only one winding shaft for such an extensive property, especially regarding the effect on the cost of underground transport, judged principally from figures as shown by the Rand Mines' system of costs under the heading of "Tramming and Lashing." Departmental costs are of great value in following the expenditure of a running concern, but the use of them for determining a policy for laying out a mine can only be made in conjunction with the whole system, embodying all other process costs, and the engineers in making criticisms, which are freely asked for, must for a moment depart from the departmental costs and judge the policy from the broader standpoint—that a departmental cost may be materially increased and justified if by so doing other departments are improved in efficiency, the chief object, of course, being maximum profits. In coal mining the minimum cost of production alone gives the best profit, whilst in gold mining this is not always the case—profits may be increased by increasing the cost of production. This paper is only intended to illustrate what has been accomplished at the Modderfontein B. mine under the circumstances that prevailed, and is not meant to convey that the system is adaptable to all mining conditions on these fields. A number of slides will be exhibited showing views of the general surface and underground arrangements. A written description of the Reduction Works is not in the scope of this paper. It must be admitted that the writer was fortunate in being able to start his ideas from the commencement of mining operations, and was therefore not hampered by having to compromise ideas with existing mine operations and workings; in other words, he had a clear field to operate upon. This is true in so far as no shafts had been sunk to the reef, and no development, further than a little prospecting, had been done; but two rectangular five-compartment shafts had been partly sunk and equipped with permanent steel headgears, winding engines and boilers, covering quite a serious expenditure. A third vertical shaft situated in the eastern area of the property had been done. The property is an extensive one, measuring along the strike 12,000 feet, or 2.3 miles, and in breadth 8,600 feet, or 1.6 miles, and at the time of commencing operations was situated 5.2 miles from the nearest railway station.

EARLY HISTORY.

First Period. The Modderfontein Extension, Ltd., was formed in July, 1895, and operations were carried on till June, 1897, when they were temporarily suspended. This course was deemed advisable consequent on the reef, where exposed, only proving of moderate value, the funds of the company being low, and the conditions of raising fresh capital unfavourable.

Second Period.—Operations were again resumed towards the end of October, 1905, when arrangements were made to finance the requirements, but the mine again closed down on the 30th June, 1906.

Third Period.—The registration of the Modderfontein B. Gold Mines, Limited (which absorbed the Modderfontein Extension), took place in November, 1908, and early in 1909 the mine was restarted.

OPENING-UP AND LAY-OUT OF PROPERTY.

In laying out this property the following main objects were kept in view: (1) The avoidance of (a) duplication of plant, both surface and underground; (b) sinking, equipping, and running numerous hoisting shafts; (2) the introduction of labour-saving devices for underground transport; (3) economy in development of large areas by avoiding useless development in unpayable ground; (4) total cost of production: maximum profits. Little was known of the nature of the reef, as the reef series were covered by coal measures lying unconformably over the quartzites. Only in one portion of the property, where a little prospecting had been done near the western boundary, the reef outcropped. The New Modderfontein Mine, which bounds it on the west, gave little information, as the workings were more or less confined to the western area of that property, some distance off, although values in the drives east, off No. 12 shaft, were encouraging. The values at the Geduld workings on the south-eastern boundary where only a little development had been done, were not encouraging at that time. As little was known of the position of the sub-outcrop, dip, etc., upon which to frame a policy for development, boreholes were sunk at distances of about 1,000 feet apart, covering a length of 12,000 feet, west to east, to prove the sub-outcrop; at the same time it was decided to sink the No. 2 shaft near the centre of the property. Some of the boreholes were sunk too far north, and missed the reef. This fact, however, enable a very fair approximation of the actual position of the reef sub-outcrops. The boreholes on the west side of the property on the whole were encouraging. From the information thus obtained, it was concluded that the reef was patchy, and probably, where payable, fairly large patches might be expected. Owing to the sharp twisting of the measures proved by boreholes on the eastern side of the No. 2 shaft it was anticipated that considerable interruptions by faulting would be met with on that side, and therefore the western area appeared to be the most likely of success, more so, guided as we were, by the promising values that had been disclosed by the eastern development of the New Modderfontein and the results from our boreholes on the west side. These conclusions, which have since proved to be correct, determined the policy of concentrating the development in the western half of the property, and it was resolved to block the country out in large blocks of 1,000 by

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* From a Paper read before the S.A.I. of E.

1,000 feet, in order that as much country as possible should be proved with the limited amount of money at our disposal for development, and in the hope of striking payable areas as early as possible. It was considered by these means that a fair knowledge of what might be expected in values would be obtained rapidly over a large area with the least possible waste of money in useless development, as nothing would prevent the splitting up of the large blocks later, if found necessary. On reference to this plan it will be observed that the general lay-out only provides one five-compartment vertical shaft near the centre of the property—No 2 shaft. No. 3 shaft, which had already been partly sunk and equipped, was discarded, and the proposed No. 1 shaft was not further considered. Thus there is only one main winding shaft, situated near the centre of the property, 1,600 feet south of the sub-outcrop. This shaft, which intersected the reef at 578 feet, is connected up to three small prospecting shafts, Nos. 5, 6 and 7, proving the reef at a depth of about 300 feet vertical near to the sub-outcrop, and to three winzes, Nos. 2, 3 and 4, also sunk from the surface, dipping from 25 to 27 degs., striking the reef on the incline 200 to 300 feet from the surface, the reef dipping 15 degs. The prospecting shafts and winzes were placed 1,000 feet apart, from west to east, following the line of sub-outcrop. No. 9 is also a prospect shaft sunk vertically to a depth of 300 feet from the surface, which will soon be holed to the western development. The No. 2 shaft thus became the centre and main winding shaft, the common centre of the whole of the mine workings, to which all the ore is gravitated or hauled by rope haulages; and early in 1909 this shaft, which had already been sunk 233 feet, was dewatered and sinking resumed to a total depth of 728 feet below the collar. The shaft was continued well below the reef to allow ample room for shaft-bottom arrangements (described later), and by the middle of August the first reef drive, No. 2 level, was started a little south of the shaft bottom. It was important that this drive should be advanced rapidly, as it became the main indicator to prove the position of the reef and its contour, information that was required well ahead before the main footwall haulage drive could be driven, and therefore every effort was made to push this drive, and the following figures are interesting, showing the speed at which it was driven: August 14th to 31st, 115 ft. east, 139 ft. west; September, 225 ft. east, 334 ft. west; October, 267 ft. east, 311 ft. west; November, 312 ft. east; 307 ft. west; December, 285 ft. east, 315 ft. west. An average speed of over 300 feet per month was maintained in all drives (7 feet by 7 feet) throughout the development period of about seventeen months, when on double shift, and 150 feet when on single shift; in the raises and winzes, which were of large dimensions (10 feet by 8 feet), a speed of 100 feet was looked for, single-shift working, although this was frequently much improved on. Four hundred and seventy-two feet were driven on one drive, one face, in a calendar month containing 27 working days, constituting a record. It is probably well known that the reef in the far eastern Rand lies on a slate footwall, which is much softer than the quartzite, and allows an easy "let go" for to cut when blasting in development, and accounts in some measure for rapid driving, but by no means does it account for all. The writer claims that the clearance of dirt is the most important item in rapid driving, whether in shaft sinking, raising, winzing or driving and, apart from exceptionally hard ground, is the main point that counts. Only on rare occasions did the machine man find his face not completely cleared after the blast at the commencement of his shift. Great care, of course, was taken in the choice of developers, and good men were obtained. Two years from the date of starting active work on the property 2,788,000 of payable ore were blocked out, together with 11,000 feet of stoping faces ready for stoping. Some of the blocks have since been split, in order to gain faces and facilitate stoping in disturbed areas, and in other cases, in the areas of doubtful payable patches, to prove values.

(To be continued.)

Supreme Court: Local Division.

DIRECTORS' BONUSES QUESTIONED BY SHAREHOLDER.

Ex parte Isaac Bernard Goodman.—Mr. M Nathan for applicant. This was an application for an order declaring the dissolution of the Suburban Estates Co., Ltd., to have been void, and that costs of the proceedings be paid out of the estate of the said company. Applicant, in his petition, traversed the constitution of the Suburban Estates Co., Ltd., and the share holding of the Realty Corporation of South Africa, Ltd. The nominal capital of the said corporation was 20,000 shares of 5s. each, of which 15,000 had been issued, and Arthur Walker held 7,530 shares, petitioner holding 3,300 shares. Arthur Walker was a director, chairman and manager of the Suburban Estates Co., Ltd., and of the Realty Corporation. At an annual ordinary general meeting of shareholders of the Suburban Estates Co., held on July 20, 1912, presided over by Arthur Walker, a resolution was passed whereby the company voted Walker a bonus of 1,000 guineas for services. At the time of the meeting petitioner was absent from South Africa. He was not a party, either personally or by proxy, to the grant of the bonus. Further, at a meeting of the Realty Corporation on August 7, 1912, the said Walker was granted a bonus of 750 guineas. At that meeting 9,450 shares were represented, Arthur Walker himself having 7,530 of these set opposite his name. On May 6, 1914, the liquidation of the Suburban Estates Co. was resolved upon, Mr. Swemmer being appointed liquidator despite an article of the company to the effect that the directors would be liquidators. Applicant submitted that the granting of the bonus of 1,000 guineas was illegal, that an investigation should be made into the circumstances, and that if necessary action be taken to reverse same. Mr. Swemmer was an employee of the Realty Corporation. A rule was granted for March 11, 1915, to be served on the liquidator, Walker, and the Realty Corporation, and to be published twice in a local paper.

ANSWERS TO CORRESPONDENTS.

"Anxious."—The annual report will be posted to you next week.

"Tins" (Bloemfontein.) (1) We cannot trace the company or the secretary. (2) The secretary of the venture informs us the matter was overlooked by the acting secretary, as he was about to depart for the front. They are writing to you direct. With regard to the information asked for in connection with the company, it is roughly this:—A new block of claims was purchased by the company for the sum of £10,000, payment to be spread over a considerable period and the company was allowed to work the claims provided that the proceeds went to the vendor. The vendor has been paid out in full, and to enable this to be done some £11,000 worth of tin was actually shipped to Europe without the aid of any machinery. The whole of the purchase price having been paid the claims are now the property of the company, and it is hoped that at some later date English title may be obtained for same. A contract to tribute which was entered into at the start of the year 1913, in favour of a German subject is null and void, and the time may arrive when the company will be able to assume full possession of the claims and again work them at a profit.

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ECONOMY OF FLOOR SPACE.
LOW FIRST COST.
NO CONDENSATION LOSSES.
ALL KINDS OF MINING MACHINERY.

THE WEEK IN THE SHAREMARKET.

Dull with Little Business—Specialities Improve—-Investment Stocks Still in Demand—Collieries Better.

Springs Mines and East Rands have been the easier features of the week. New Modders continue to be well spoken of in the market for investment, and have maintained their price, cdd parcels being mostly in demand. For Bantjes there has been a good deal of enquiry, but very few have come into the market and the last price made was wide (9s. 3d.—10s.). Apex have been enquired for, and all coal shares have been better in view of the good profits being earned, despite the present dislocation of the coal export trade owing to the war. Tins are quieter, on the slight drop in the cash price for the metal. The market seems to be in a waiting mood.

* * * *

A London correspondent writes: "The experience on the Stock Exchange continues quite satisfactory in the circumstances, and the market has been much cheered during the week by the evidence of the readiness of the Treasury to remove restrictions which were more irksome than useful. A notable instance of this was the case of the declaration which has hitherto been demanded from buyers of securities as well as from sellers. In the sense contemplated by the Treasury regulations, it is difficult to see how any purchase of shares in this market can go to the benefit of an alien enemy, the seller being the beneficiary in that he changes scrip for cash. Considerable comment has been caused by the regulation ever since the reopening of the House, and the Treasury has now moved in the matter, the clause being altered so as to apply in future to sellers only. Another direction where the regulations worked badly was in that of dividend payments by those mining companies which were approaching exhaustion, and where the dividends consequently represented to a large extent repayment of capital. As will be remembered, those speculators whose accounts were extended over the end of the war are entitled to receive all dividends upon providing margin on their stocks, which in the case of mining shares was 10 per cent., but in many cases these repayments of capital represented much more than 10 per cent., and the effect was to considerably reduce the value of the security left in the lenders' hands. This objection has now been met by restricting all mining dividends for the future to 10 per cent., based on the end of July prices of the shares, any surplus over this amount going in reduction of the account."

* * * *

	Fri., 12th.	Sat., 13th.	Mon., 15th.	Tues., 16th.	Wed., 17th.	Thurs., 18th.
Adair-Ushers ..	—	0 4*	—	0 4*	0 4*	—
African Farms ..	9 1*	9 1*	9 1*	9 1*	9 1	9 1*
Apex Mines ..	12 6*	13 0	13 0*	13 0*	13 0	13 0*
Aurora Wests ..	—	—	—	10 0†	—	10 0†
Bantjes Consolidated	—	8 9	8 0*	8 6*	8 9*	9 3*
Brakpan Mines ..	45 6†	44 0*	45 6†	45 6	—	—
Breyten Collieries..	20 0*	—	20 0*	20 0*	20 0*	20 0*
Bushveld Tins ..	0 5*	0 5*	0 5*	0 5*	0 6*	0 5*
Cassel Coals ..	10 0*	—	10 0*	11 0*	—	—
Cinderella Cons. ..	3 6*	3 6*	3 9*	3 9*	3 9*	3 9*
City & Suburbans .	43 0*	43 6*	43 6*	44 0*	44 0*	44 0*
City Deeps.. ..	55 0*	58 0†	58 0†	55 3*	—	55 0*
Cloverfield Mines ..	4 1*	4 0*	4 1*	4 2	4 1	—
Clydesdale Collieries	9 0*	9 0*	9 0*	9 6*	10 0*	9 6*
Con. Investments ..	13 0*	15 6†	15 6†	15 6†	—	—
Con. Langlaagtes...	32 9†	32 0*	32 0*	32 0*	32 0*	32 0*
Con. Main Reefs ..	16 9*	16 6*	16 3*	16 9*	16 9*	17 0
Con. Mines Selection	—	8 0*	8 3*	—	8 3*	8 3*
Coronation Collieries	21 0*	21 0*	21 0*	—	21 0*	—
Crown Mines ..	80 0†	73 9*	73 9*	75 0*	75 0*	75 0*
East Rand Centrals	2 0*	2 3†	2 0*	2 0*	—	2 0*
East Rand Coals ..	1 5*	1 4*	—	1 4*	1 4*	1 4*
East Rand Deeps ..	1 4*	1 4*	1 4*	1 4*	1 4*	1 4*
East Rand Props.. .	27 6*	28 3†	27 6*	28 6†	28 6†	27 0
East Rand Debentures	£87½*	£87½*	£87½*	£87½*	£87½*	£87½*
Eastern Golds ..	1 0*	1 0*	1 0*	1 1*	1 0*	1 1*
Ferreira Deep ..	—	—	—	—	45 0*	45 0
Frank Smith Diam.	1 4*	1 3*	1 3*	1 3*	—	1 3*

* Buyers. †Sellers.

	Fri., 12th.	Sat., 13th.	Mon., 15th.	Tues., 16th.	Wed., 17th.	Turs., 18th.
Geduld Props. ..	21 6†	20 6*	20 6*	20 6	20 0*	20 6*
Glencairns	1 0*	1 0*	1 0*	1 2*	1 3*	1 3*
Glencoe Collieries ..	—	—	5 9*	5 9*	6 0*	—
Government Areas..	17 3*	17 3	17 0*	17 0	17 3*	17 3*
Jupiters	3 6†	3 6*	3 6*	3 6*	3 6*	3 6*
Kaalfontein Diam...	0 3*	0 4*	0 3*	0 3*	0 3*	0 3*
Klerksdorp Props...	2 6†	2 6†	2 6†	2 6†	2 6†	2 6†
Knight Centrals ..	5 4*	5 9†	5 4*	5 6*	5 6*	5 6*
Knights Deep ..	26 0†	23 6*	—	23 6*	23 6*	23 6*
Lace Props. ..	3 3†	3 0*	2 11*	2 11*	3 1†	3 2†
Langlaagte Estates.	17 0*	17 0*	17 0*	17 0*	17 0*	17 0*
Luipaardsvlei Est...	—	6 0*	—	7 6*	7 1*	7 6*
Lydenburg Farms..	2 7*	2 7*	2 8	2 8*	2 8*	2 8*
Main Reef Wests...	—	5 6*	5 6*	5 6*	5 6*	6 0†
Meyer & Charltons .	—	—	—	90 0*	90 0*	—
Middlevlei Est. ..	1 6*	1 6*	1 6*	1 6*	1 6*	1 6*
Modder B's ..	89 0*	90 0†	87 6*	88 0†	87 0	—
Modder Deeps ..	60 9	60 3	60 6*	60 0*	60 9	60 3*
National Banks ...	£11½†	£11½†	—	—	—	—
New Era Cons. ..	4 10*	—	5 1*	5 2*	5 2*	5 3*
New Geduld Deeps.	1 9*	1 9*	1 9*	1 9*	1 10*	1 10*
New Gochs.. ..	12 9*	12 9*	12 9*	12 9*	12 9*	12 9*
New Heriots ..	61 6*	62 0*	62 6*	62 6*	62 6*	62 6*
New Kleinfonteins .	19 3*	19 3*	19 4*	19 3*	19 4½*	19 6*
New Modderfonteins	—	250 0*	250 0*	—	—	247 6*
New Unifieds ..	19 0*	19 0*	19 0*	18 9*	18 9*	18 9*
Orange Diamonds..	0 10*	0 10*	0 10*	0 10*	0 10*	0 9*
Pretoria Cements ..	44 0*	44 0*	44 0*	44 0*	44 6	—
Princess Estates ..	—	4 3*	6 0†	4 3*	4 3*	5 0†
Rand Klips ..	2 7*	2 7*	2 7*	2 7*	2 7*	2 7*
Rand Nucleus ..	1 7	1 6*	1 6*	1 6*	1 6*	1 6*
Randfontein Deeps	3 0†	2 9*	2 9*	—	2 9*	2 9*
Randfontein Est. ..	15 6*	15 6*	15 6*	15 6*	15 3*	—
Rooibergs	21 0*	21 6*	21 6*	—	22 6†	—
Roodepoort Uniteds	6 0†	6 0†	6 0†	6 0†	6 0†	—
Ryan Nigels ..	—	—	—	—	2 0*	—
Shebas	2 6*	2 6*	2 6*	2 6*	2 6*	2 6*
Simmer Deeps ..	1 6*	1 6*	1 6*	—	—	1 6†
S.A. Lands ..	2 4*	2 6†	2 4*	—	2 4*	2 6*
Springs Mines ..	14 6	16 3	16 0	15 3*	15 3*	15 3
Sub Nigels ..	9 0*	9 0*	9 0*	9 6	9 7*	10 0*
Swaziland Tins ..	22 6*	22 6*	22 6*	22 6*	—	22 6*
Transvaal. Coal Trust	31 0*	—	32 0	31 0*	32 0†	32 0†
Trans. Con. Lands..	—	—	—	—	—	10 6*
Trans. G.M. Est....	—	—	36 0†	34 0*	35 6†	—
Van Ryn Deeps ..	45 3	45 0	45 0	45 0	45 3	45 0
Village Deeps ..	34 0*	—	—	35 6†	—	—
West Rand Cons. ..	—	—	—	5 0*	5 0*	—
Witwatersrands ..	—	—	—	60 6†	58 0*	57 6*
Wit. Deeps ..	—	35 3*	36 0	35 0*	35 0*	35 0*
Wolhuters	12 9*	12 9*	13 0	12 9*	12 10*	12 9*
Zaaiplaats Tins ..	25 6*	25 9*	25 6	25 6*	25 9*	25 9
Standard Banks ..	£10¼†	—	—	—	—	—

* Buyers. † Sellers.

The best "Reef Traveller" is the *South African Mining Journal*.

Apple Growing in Tasmania.

We desire to draw attention to the fact that recently several South Africans have, after thorough investigation, invested in orcharding in Tasmania, under our absentee system. Under this system we plant and manage for absentee owners, with extended payments, under Government expert supervision until such time as it suits them to take possession in person. This provides a good investment and a future home in Tasmania, where climate, scenery and social conditions are ideal. We are now managing for over seventy absentees. Land situated on fine navigable waterway. Pamphlets, giving full particulars, forwarded on application to our Mr. J. P. Johnson (for many years on the Rand, and now settled on our Kelso Estate), who can be interviewed at the Grand National Hotel, Rissik Street, Johannesburg. Messrs. Sadleir & Knight, Orchard Agents and Attorneys, Launceston, Tasmania.—Advt.

Commerce and Industries.

Lever's and the "N.T.C."

The latest evidence of the activity of Lever Brothers is the announcement that it has made arrangements for securing a controlling interest in the New Transvaal Chemical Company. As recently as last August the firm absorbed A. & F. Pears, though without destroying its individuality. The New Transvaal Chemical has a very mixed assortment of assets, and deals in a variety of products from mineral waters to artificial manures. It is largely interested in the soap business in South Africa, and since Lever Brothers have also big factories here a union of working forces is obviously likely to advantage both concerns, though how the consumer may be affected is another question. The New Transvaal Chemical dates from 1896, and took over an undertaking which was formed four years previously. The original issued capital was only £10,300, but this has since been increased by successive stages to £300,000, and the deal with Lever Brothers makes the total £500,000. In addition, there are debentures amounting to £19,500 outstanding. The only public issue in London was the £150,000 preference shares offered in 1912. The record of the concern since 1902-3 is as follows:—

Year ended 30th June.	Net Profit.	Ordinary Dividend.	Reserve Appropriation.	Carry Forward.
	£	%	£	£
1903	7,600	15	nil	1,800
1904	9,900	15	nil	5.100
1905	13,600	25	2,000	2.500
1906	15,500	25	2,000	1.700
1907	20.300	25	2,000	4,000
1908	15,300	25	nil	2.200
1909	27,800	25	1,000	1,000
1910	40,300	25	†20,000	5,800
1911	46,400	25	10,000	4.700
1912	33.300	18	5.000	3.900
1913	21,700	8	*20,000	3,100
1914	9,200	nil	nil	3.300

† Including £12.500 from share premiums.
* From mining claim profits.

Evidently competition has lately affected earnings, and this no doubt has influenced the board in coming to an agreement with Lever Brothers. Net profit is now down to the level of a decade ago, and for the first time for a considerable number of years there is no dividend on the Ordinary capital. The present Ordinary shares under the readjustment of capital become eight per cent. cumulative "A" Preference shares and the existing six per cent. cumulative Preference will become first Preference shares. Neither will in future be entitled to participate in surplus profits, but to compensate for this the holders will have divided among them £50,000 new first Preference shares, to be paid up out of the reserve fund, which just amounts to that sum. The right to nominate four directors out of seven also goes to Messrs. Lever's. The New Transvaal Chemical, with the £150,000 thus obtained, will subscribe for the corresponding amount of fifteen per cent. cumulative Preferred Ordinary shares in Lever Brothers. This will raise the total issued capital of the Port Sunlight undertaking to £13,111,500.

New Companies.

The following companies were registered in the Transvaal during January:

The Driefontein Trading Company, Ltd., No. 7, Natal Bank Chambers, Market Street, Johannesburg; capital, £400.

Palm Court Tea Room and Bioscope, Ltd., Basement, Chudleigh's Buildings, Eloff Street, Johannesburg; capital, £1.000.

The Town Hall Cash Supply Stores, Ltd., 89, President Street, Johannesburg; capital, £300.

The Transvaal Mattress Company, Ltd., 180, Commissioner Street, Johannesburg; capital, £5,000.

S. Fisher and Simmons, Ltd., No. 136, Marshall Street, corner Von Brandis Street, Johannesburg; capital, £40,000.

Chadwick and Gould, Ltd., Strathearn House, corner Fox and Rissik Streets, Johannesburg; capital, £2.000.

FOREIGN COMPANIES.

The Pilgrim's Rest Consolidated Gold Fields, Ltd., c.o. Somerville Craig Carrathers, No. 11, Meischke's Buildings, corner Harrison and Market Streets, Johannesburg; capital, £25,000.

Ceylon Lydenburg, Limited.

(Incorporated in the Transvaal).

NOTICE TO SHAREHOLDERS.

NOTICE is hereby given that the Sixth Ordinary General Meeting of Shareholders will be held in the Board Room, The Corner House, Johannesburg, on FRIDAY, the 23rd day of APRIL, 1915, at noon, for the following business:—

1. To receive and consider the Balance Sheet and Accounts for the year ended 31st December, 1914, and the Reports of the Directors and Auditors.
2. To elect Directors in the place of those retiring, in accordance with the provisions of the Company's Articles of Association.
3. To elect Auditors in the place of Messrs. C L. Andersson & Co., who retire, but are eligible for re-election, and to fix their remuneration for the past audit.
4. To transact General Business

The Transfer Books of the Company will be closed from 17th to 23rd April, 1915, both days inclusive.

By order of the Board,

TRANSVAAL CONSOLIDATED LAND & EXPLORATION CO., LTD., Secretaries.

W E. S. LEWIS, Secretary.

Head Office,
The Corner House, Johannesburg,
16th February, 1915.

Anglo-French (Transvaal) Navigation Coal Estates, Limited.

(Incorporated in the Transvaal.)

NOTICE TO SHAREHOLDERS.

NOTICE IS HEREBY GIVEN that the Thirteenth Ordinary General Meeting of Shareholders in the above-named Company will be held in the Board Room, Fourth Floor, National Bank Buildings, Simmonds Street, Johannesburg, on WEDNESDAY, the 17th day of MARCH, 1915, at 10 a.m.

BUSINESS:

1. To receive and consider the Statements of Account and the Reports of the Directors and the Auditors for the year ended 31st December, 1914.
2. To confirm the appointment of Mr. W. J. Gau as a Director of the Company in place of Mr. G. W. Higgins, resigned.
3. To elect Directors in the place of Messrs. Wm. Dalrymple. W. J. Gau, B. Hansford, C.B., A. Little, C. P. Marais, and Edw. H. Read, who retire in terms of the Company's Articles of Association, but who are eligible and offer themselves for re-election.
4. To appoint Auditors for the ensuing year, and to fix the remuneration of the retiring Auditors, Messrs. F. W. Diamond & English and Samuel Thomson.
5. To transact all such other business as may, under the Articles of Association, be transacted at an Ordinary General Meeting.

By Order of the Board.

L. S. RAYMOND, Secretary.

Head Office:
3rd Floor, National Bank Buildings.
Simmonds Street, Johannesburg.
12th February, 1915.

45640

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MINING MEN AND MATTERS.

Mr. G. H. Blenkinsop, M.I.M.M., has joined Enslin's Horse.

* * * *

The next meeting of the Chemical, Metallurgical and Mining Society of South Africa will be held to-night at the School of Mines.

* * * *

The annual meeting of the Association of Mine Managers of the Transvaal was held yesterday. A full report of the proceedings will appear in our next issue.

* * * *

Sir Joseph Robinson, Bart., has arrived in Capetown, and will doubtless arrive in Johannesburg in time for the annual meetings of the Randfontein group of companies.

* * * *

A large audience listened to the Presidential Address delivered by Mr. Bernard Price, the new President, at the meeting of the S.A.I. of E.E. on Thursday night. A full report of the address will appear in a special electrical supplement to our next issue. The latter will contain a number of special features and articles of interest to electrical engineers, and will be profusely illustrated.

* * * *

Professor Lawn has decided for family reasons to relinquish his appointment of Consulting Engineer to the Johannesburg Consolidated Investment Company, Ltd., at the end of April next, and he will be succeeded by Mr. W. L. White, who for the past four and a half years has held the position of Assistant Consulting Engineer to the Company. Professor Lawn will retain his connection with the Johannesburg Consolidated Investment Company in London in an advisory capacity.

When communicating with advertisers kindly mention the *South African Mining Journal.*

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For those holding Certificates as Mine Managers, Mine Surveyors, Mine Captains, Mechanical and Electrical Engineers and Engine-Drivers. Private Individual Tuition and Correspondence lessons where personal tuition is impossible. Practical Mathematics and Electrotechnics.—E. J. MOYNIHAN, Consulting Engineer, 35-6, Cuthberts' Buildings, Box 2061, Johannesburg.

Wonder Mine in Liquidation.

In accordance with Section 168 (2) of the Companies' Act, 1909, a general meeting of the Wonder Mine Company will be held at 12, Transvaal Bank Buildings, Fox Street, Johannesburg, on Saturday the 6th day of March, 1915, at 12 o'clock noon, for the purpose of receiving from the liquidators an account of their acts and dealings and of the conduct of the winding up during the six months ended 13th February, 1915.

INVESTORS' DIARY.

FORTHCOMING COMPANY MEETINGS.

Feb. 26.—Southern Freeholds; South Deeps; East Rietfontein Syndicate.
March 17.—Anglo-French Coal Estates.
March 15.—Worcester Exploration Co.
March 26.—Jupiter G.M. Co.; Simmer Deep; Wolhuter; Bucks Reef.
April 23.—Ceylon Lydenburg.

WITBANK COLLIERY, LIMITED.

(Incorporated in the Transvaal).

DIVIDEND No. 20.

NOTICE is hereby given that a Dividend of Seven and One-Half Per Cent. (7½ Per Cent) for the six months ending 28th February, 1915, equal to 1s. 6d. per share, has been declared payable to Shareholders registered on the 28th February, 1915 Dividends Warrants will be paid out as soon as practicable after receipt of London Transfer Returns to that date.

The Transfer Registers of the Company will be closed from the 1st to the 4th March, 1915, both days inclusive.

By order of the Board,

A. GREGOR, Acting Secretary.

Head Office, Johannesburg,
16th February, 1915.

Printing, Bookbinding, Account Books, Tracing Cloth, Tracing Paper, Drawing Paper, Ferro Prussiate, Ferro Gallic, Indian Inks, Rubber Stamps, Stationery of all descriptions, Draughtman's and Surveyor's Requisites.

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TELEPHONE 2066.

The Week's Company Meetings.

FERREIRA DEEP.

A Review of the Position.

The annual meeting of the Ferreira Deep. Ltd., was held last week in the board-room, Corner House. There were present Messrs. H. C. Boyd (chairman), R. W. Schumacher, J. Munro, E. A. Wallers, A. G. Gill, C. Meintjes, H. A. Rogers, Max Honnett, S. C. Steil, J. H. Barry, and H. J. McCormack.

Chairman's Speech.

The Chairman said: The net profit for the 12 months ended 30th September last dealt with in the accounts before you was £650,550. In spite of a materially lessened labour force, the ore milled was increased by nearly 21,000 tons, but the recovery decreased by 4s. 6d. per ton milled, owing mainly to the treatment of an increased quantity of the lower grade south reef in the eastern section of the mine and a certain amount of main reef near the western boundary, which is of low value, but can be profitably mined when withdrawing the packs in the overlying main reef leader stopes. Working costs for the year were reduced by 2s. 7d. to 17s. 6d. per ton, and for the last four normal months of the period to under 17s. per ton: in September results were abnormal owing to the serious skip accident in No. 1 shaft. These costs indicate the increased efficiency obtained, and may be regarded as creditable, when we bear in mind that the expense involved in shaft maintenance and support of stopes is 1s. 6d. per ton milled, compared with only a trifling figure in the days before the first troubles showed themselves. The special efforts necessary at times in this direction, entailing the diversion of part of the labour force from productive work, have also been a source of additional expense, besides restricting the scale of operations during times of shortage of labour.

Of the above profit, taxes absorbed £57,513 and capital expenditure, mainly in connection with the pumping plant, £5,124. The carrying out of the scheme for the concentration of all pumping at No. 1 shaft has been somewhat delayed by the accident at No. 2 shaft, to which reference will be made later, but all arrangements will be completed in a few weeks. Only a nominal amount remains to be spent on this account and no further capital expenditure of any kind is at present contemplated. Two dividends at the usual rate of 25 per cent. each were paid, amounting to £490,000, the balance carried forward being £366,195. Attention may here be drawn to the fact that a bonus dividend of 25 per cent. was declared payable to shareholders registered on the 31st December.

Ore Reserves.

Allowing for the natural diminution of the outcrop section, and the relatively small amount of development that remains to be done in the Deep Mine, the ore reserve position at the close of the past financial year was satisfactory, there being a total reserve on the two richer reefs of 1,893,100 tons of an average value of 8.5 dwts. per ton. The ore broken and stored in packs in the mine, forming additional reserves, was increased on balance by nearly 49,000 tons to 177,500 tons. You will have noted further that it is considered that of the 600,000 tons of low valued main reef, much can be mined at a profit in conjunction with the leader packs. On the whole, the values disclosed by the past year's development were more favourable than could be anticipated at this time last year. The most interesting feature has been the fulfilment of the hopes expressed at the last annual meeting regarding the possibilities of the main reef leader in the lower levels east of No. 1 shaft, where, as you will remember, the values had till then been disappointing. A considerable area of payable ground was disclosed by development on the 12th, 13th and 14th levels, which has since the close of the year been proved to extend considerably further to the east up to the intersection of this reef by the Grahamstown dyke, now located at several points on these levels. In view of these results, work has been restarted on the 11th level, so far with disappointing results; the ground is disturbed, however, and further advance is being made in the hope of encountering better values. Immediately west of this shaft exceptionally good south reef was opened in depth. The driving of the cross-cut from the 12th level through the Grahamstown dyke has been completed, and what is evidently the south reef has been encountered. The average value of the 40 ft. so far driven and sampled east and west on this reef is a little over 9 dwts. over an assumed stoping width of 60 inches.

Fall of Ground.

In spite of the continuous vigilance exercised by the management, a serious fall of ground occurred in No. 2 shaft in the neighbourhood of the 5th level station on the 2nd December last, following on one of the earth movements which are common in this area. It was undoubtedly owing to the system of packing and sand-filling that the damage was confined to the shaft, but there was serious interruption to current work while the repairs were proceeding, and December profits were, as you are aware, greatly reduced in consequence. These repairs entailed considerable risk on the part of those employed, but, considering the extent of the damage, they were rapidly and skilfully accomplished without accident, and normal operations were resumed on the 1st ult., with the result that we returned to a profit of approximately £46,000 for January, costs still being affected by expenditure in connection with the accident. The manner in which this dangerous and difficult job was tackled reflects the greatest credit on all concerned. Though, as you must be aware, the safety of the mine has received unflagging attention during the last few years, this unfortunate accident naturally led us to consider further the whole position of the mine, and I am glad to be able to state that, after the fullest investigation, we are satisfied that, humanly speaking, there is no likelihood of our being prevented from successfully exploiting any part of the mine, even if there should be further serious movement of the surrounding country. The worst that is to be feared is that we may be temporarily cut off from some part of the workings or suffer from interruption in one or other of the shafts for a time.

Current Year.

The consulting engineer, in his report, refers to a likely reduction in the total profits for the current year. The average value of the ore reserves, as you see, is slightly reduced and the advisability of milling a certain amount of main reef has already been referred to. As regards tonnage to be milled, as you are aware we have so far been able to maintain in normal months a high rate of crushing in spite of the small amount of ore coming latterly from the outcrop section, but we must look forward to a reduction in this respect before long, as so little is left there. The condition of the deep mine is such, however, that we may be able to supply most of the deficiency from that section, and it may be that only toward the close of the current financial year will a material reduction in the tonnage milled monthly be apparent. I may mention that last month over 61,000 tons were raised through the deep shafts, showing how greatly their hoisting capacity has been improved. It is not now proposed to increase the crushing capacity at the deep mill, but to continue to transport on the surface to the outcrop mill the balance of the ore which cannot be treated at the deep. During the period which we have now reviewed, the strain on the management has at times been very severe, and the board desires to express its appreciation of the services rendered by Mr. Cazalet, Mr. Trump and the staff generally. I now beg to move the adoption of the reports and accounts for the year ended 30th September, 1914.

The motion was seconded and carried. The retiring directors were re-elected, and the auditors reappointed.

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THE SOUTH AFRICAN

Mining Journal,

WITH WHICH IS INCORPORATED
South African Mines, Commerce and Industries.
ESTABLISHED 1891.

VOL. XXIV., PART I.] FEBRUARY 27, 1915. [No. 1222.

HEAD OFFICE: 176-180, Stock Exchange Buildings, Fox Street (2nd Floor), Johannesburg, Union of South Africa.

Telephone **913.** P.O. Boxes **963** and **418.**

Cable and Telegraphic Address: **"MINING JOURNAL."**

AGENTS FOR GREAT BRITAIN: Argus Printing and Publishing Co., Ltd., Byron House, 82-85, Fleet Street, London, E.C.

AMERICA: Gotham Advertising Co., 95, Liberty Street, New York.

ANNUAL SUBSCRIPTION RATES: Oversea, £2; South Africa (by post), £1 10s.; Local Delivery (Town only), £1 6s.

Copies of this journal are obtainable at all Branches and Agencies of the Central News Agency, Ltd., at all News Agents and Railway Bookstalls throughout South Africa, and at the London Agency as above.

NOTICE.—The postage of this issue of the *S.A. Mining Journal* is: South Africa, 1d. All other parts, 2d.

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Notes and News.

Sand Laying on Dumps.

Before the Chemical, Metallurgical and Mining Society last Saturday night, Mr. E. H. Johnston, of the E.R.P.M., read a most interesting paper on the method of laying the dust on the dumps at that property. Material from neighbouring vleis is used for this purpose with complete success and, apparently, at less cost than that of the Ferreira Deep salt process. For mines less fortunately situated in this respect than the E.R.P.M. the latter process, however, still appears the more suitable.

* * * *

A Committee for Consideration of New Issues.

The Chancellor of the Exchequer has appointed a Committee to consider and advise upon new issues of capital, and the first meeting was held in mail week, so that no time has been lost. The Committee is such as to inspire confidence, and consists of the Right Hon. Viscount St. Aldwyn, chairman (formerly Chairman of the Bank of Africa); Lord Cunliffe, Governor of the Bank of England; Sir Frederick Banbury; the Right Hon. Sir Thomas Whittaker; and Mr. G. Stapylton Barnes, of the Board of Trade. No mention is made of any intention at present to modify the most objectionable clauses of the regulations, but with such a business committee there is good hope that this will ensue. That South African interests will not be overlooked is clear from the composition of the Board.

* * * *

S.A.N.U.

A branch of the South African National Union is about to be started in Capetown, where the Union was originally founded by Sir Pieter Bam in 1908. His Excellency Lord Buxton is to preside at the first meeting in the City Hall on the 1st March. There should be a wide field of work before the society at the present time in that part of the country, which contains the bulk of our manufacturing industries.

* * * *

The Rise in Tin.

On the Metal Exchange, in mail week, tin had a sharp spurt, and copper and spelter (zinc) also both scored further advances. Messrs. Lewis Lazarus and Sons report that tin was an active market, and moving in sympathy with Eastern prices. Messrs. Robert Katz and Co., in their weekly report, state that home and export demand have continued extremely active, while the difficulties of obtaining tin from the large quantities arriving are only lessening very slowly. The East sold liberally; shipments this month are now estimated at 5,500 tons. America remained rather a reserved buyer. Billiton has been forthcoming more freely, and bids have again been invited for Banca in Java at a price near present quotations, but in as yet too indefinite a way for business. Messrs. H. R. Merton and Co. write: The feature has again been the scarcity of early metal, which has been in daily request for shipment to various Continental countries. The continuation of large enquiries from Scandinavia are getting to be regarded with some misgivings, but buyers there state that most of the tin is for transhipment to Russia. The East has sold freely every day, and the volume of the quantities disposed of is somewhat of a surprise, as general anticipations were for a decreased production from January onwards. China has practically ceased offering this week, but there are signs of the Dutch Government being more disposed to part with some of their holdings lying in Java. Home manufacturers have become alarmed at the continued stringency of early metal, and a good business has been done in some cases for forward delivery. On the other hand, American operators and consumers appear to take a sceptical view of the position. The price there is below London parity for all deliveries, and America has re-sold here, although towards the end of the week the tone has become steadier.

Decrease in Coal Traffic.

It appears that the decrease in the coal traffic reflected in the railway revenue is primarily due to the fact that export has practically stopped. Steamers which would in normal times load coal or call at South African ports for a cargo of coal now go to the Argentine to take advantage of the abnormally high freights ruling for transport of grain. Latest advices state that the freightage from La Plata is ranging from 62s. 6d. to 67s. 6d., against 11s. to 15s. in normal times.

* * * *

Oceana Consolidated.

Although the accounts of the Oceana Consolidated Company only cover the year ended 30th June last, and thus do not reflect the results of the war, it is not surprising, in view of the unfavourable market conditions throughout the period, that the credit balance at profit and loss account should show a serious set-back. The balance of £15,300 compares with £38,300 for 1912-1913 and £16,500 for 1911-12. But this time, as last, provision for depreciation of investments once more dashes any hope of a dividend entertained by any confirmed optimist among the shareholders. Both the reserve against quoted investments at 30th June, 1913, and the suspense reserve account, together totalling £113,000, are this time taken into the appropriation account to provide for a depreciation of £122,000. The net result is that £19,000 is carried forward, against £3,000 brought in. The balance sheet shows cash in hand of £26,000 at 30th June last, against £22,000 in the previous accounts.

* * * *

Revised Mining Statistics.

The blue-book giving the final, complete and revised mining statistics for 1912 has only now been issued by the Imperial Government. As regards the output of gold in the British Empir there was an increase of 25,414 kilo grammes (817,000 ozs.) in 1912, but this was more than counterbalanced by a reduced production in several of the foreign countries, and the net result shows a decrease of 4,382 kilograms as compared with 1911. The total outpu of gold for the world in 1912 was 712,483 kilogram (22,906,846 ozs.), of which the value is estimated at more than £97,000,000 sterling. The British Empire supplied over 61 per cent. of the output, Australia contributing over 10 per cent., South Africa nearly 40 per cent., and Canada, the Gold Coast, India, New Zealand and Rhodesia combined nearly 11 per cent. of the total. The United States contributed nearly 20 per cent. and Mexico and Russia combined over 11 per cent. In the case of iron, the United States with an output of nearly 30⅗ million metric tons was considerably ahead of any other country. The German Empire with nearly 8½ million tons, France with over 7⅗ million tons, Great Britain with over 4½ million tons, Spain, Russia and Sweden, each with over 4 million tons, came next. It is important to point out that the quantities of iron, and indeed the quantities of the other metals included in the computations, are those considered obtainable from the ores raised in the countries in question, and must not necessarily be taken as a measure of their metallurgical industries.

* * * *

Stock Exchange Values.

The *Bankers' Magazine* has resumed its useful and interesting practice of giving a monthly valuation of representative Stock Exchange securities, and in the issue for February makes a comparison between values as at 30th July and 20th January. Practically only those stocks, shares and bonds have been included in which dealings have actually taken place, so that the criterion set up may be regarded as on the whole a reliable one as indicative both of the changes in values recorded and of the present trend of prices. The movement of quotations now is undoubtedly upwards, though, of course, the difference in the aggregate value of the securities embraced by the table between July and January is a fall in bulk of considerable magnitude—£68,690,000—despite the support accorded by the fixed minimum of gilt-edged issues. The relative decline, however, is not so great as these formidable figures suggest, being only 2·2 per cent., a consoling fact, though the greatest range of depreciation is lost in the period which has had to be covered for a start. In some groups there are actually appreciations—notably of 5·5 per cent. in shipping shares, of 4·7 per cent. in copper mining shares, of 2·9 per cent. in iron, coal and steel shares, of 2·4 per cent. in American rails, and of 0·3 per cent. in Home railway debentures. The most pronounced falls are 20·1 per cent. in brewery stocks, 15·3 per cent. in gas stocks, 10 per cent in foreign rails, 9·5 per cent. in South African mines, and 9·2 per cent. in commercial and industrial shares. In other cases the declines are moderate and of a quite ordinary character. On the whole, the comparison does much to reassure us that the return to normal levels of security values generally is not necessarily by any means remote or unlikely.

* * * *

Capital Issues in 1914.

With the Imperial Government putting an embargo on new capital applications in London, the issues in 1914 assume additional interest. The annual total for the last nineteen years we give below, omitting floating paper and including the total capital of purely new ventures:—

	No.		Amount. £
1896	670	....	184,863,900
1897	621	....	191,764,600
1898	500	....	190,621,100
1899	468	....	176,916,500
1900	434	....	192,518,800
1901	363	....	176,712,300
1902	367	....	184,965,100
1903	310	....	125,143,100
1904	310	....	109,198,500
1905	408	....	179,891,200
1906	410	....	129,477,900
1907	398	....	148,599,600
1908	518	....	226,561,700
1909	666	....	263,368,200
1910	948	....	362,408,400
1911	704	....	250,174,000
1912	666	....	236,712,000
1913	704	....	333,625,800
1914	675	....	689,055,400

Deducting the War Loan of £350,000,000, the total for 1914 is still £339,055,400, or actually £5,429,600 more than in 1913. At the end of July, just prior to the outbreak of hostilities, the increase was £77,121,800, so that the war has been responsible for a decrease of £71,692,200, even supposing there had been no further advance during the last five months had the international crisis not arisen. The year's offerings may be divided up as follows, but in this case only the capital of new ventures actually offered or allotted is included:—

Description.	1914.		1913.	
	No. of new issues.	Share or Deb. capital or amount of loans.	No. of new issues.	Share or Deb. capital or amount of loans.
		£		£
Public loans.	182	550,850,900	129	118,327,600
Financial	40	9,513,700	53	14,468,000
Commercial and Miscellaneous	83	9,760,200	103	18,025,400
Issues by existing companies	335	105,486,000	371	172,041,300
Mining	35	4,504,300	48	5,633,000
Total	675	680,115,100	704	328,495,300
Bill issues	46	145,625,000	14	18,750,000
Grand total	721	825,740,100	718	347,245,300

Bankers' Views of the Position.

It was to be expected that at the meetings of the big joint stock banks in London the general note struck would be one of congratulation, for certainly Bank shareholders have reason to be abundantly grateful for the way in which these institutions have weathered the storm; and full appreciation of the skilful way in which the financial crisis was handled by the Government was also to be anticipated under the circumstances. The suggestion was in fact put forward by the Deputy-Chairman of Lloyds Bank that it would be fitting recompense if Mr. Lloyd-George were made a Duke! But what is more satisfactory is to find that the outlook appears to be viewed with confidence by the leaders of the banking world. Mr. Vassar-Smith, the Chairman of Lloyds Bank, in commenting upon the special allocation of £250,000 for contingent depreciation, frankly admitted that if the war continues for a long time there will be in all probability a large depreciation in investments, "and also," he added, "perhaps a loss in some of our advances owing to the want of margin in the securities." But he followed this immediately by the comforting remark that while there had been a divergence of opinion between the Boards of the different banks as to the prudent course to pursue in the matter of dividends, they had decided that after making such a provision for contingencies they were justified in maintaining their Ordinary distribution. He was also able to give a very satisfactory account of the general commercial and industrial position in the districts served by the bank, and this was confirmed by Sir Felix Schuster, at the meeting of the Union of London and Smiths Bank, the latter remarking that the reports they received from their country branches were mostly of a hopeful character. Sir Felix, moreover, concluded his speech with the statement that in financial and commercial matters the outlook at the beginning of the year appears far more reassuring and promising than seemed possible only a little while ago.

* * * *

Zaaiplaats Position.

At the Zaaiplaats mine, the mill ran on 72 days during the quarter ended January 31, crushing 4,582 short tons, the duty per stamp being 10·6 tons per 24 hours. In addition 1,450 short tons of sand and slimes residues were retreated, while 1,978 tons of overburden were dealt with by the alluvial plants. The output for the quarter amounted to 206 long tons of concentrates assaying 72·7 per cent. metallic tin. The estimated profits for the quarter amounted to £10,672 14s. 6d., made up as follows:—Estimated profit for the three months' operations, £10,820 12s. 4d.; less adjustments of estimated values of previous shipments, £147 17s. 10d.; profit declared for the quarter, £10,672 14s. 6d. The net estimated revenue from the 38 tons held over from the previous quarter amounts to £3,618 7s. 6d. The average price per ton of metallic tin on which the above figures have been calculated is £148 14s. Work in Nos. 6 and 6 sections was confined to branch ore bodies which have not undergone any marked change during the quarter. Developments in No. 13 section were very favourable during the quarter. The grade of ore won from the whole section was of high quality. During the quarter 4,471 tons of ore were mined and disposed of as follows:—Waste sorted, 1,171 short tons; sent to mill, 4,582 short tons; total, 5,756 short tons; less taken from reserve dumps, 1,285 short tons; tons mined, 4,471 short tons. Continuous rains have interfered with the labour supply. By slow degrees the complement was raised to two-thirds normal strength at the end of January, but this number suffices for the most essential work only. Twenty-six inches of rain fell on 11 days. All streams and springs have been revived to such an extent that no water shortage is anticipated this year. The board have decided to revert to the practice of advertising in the newspapers a statement of the results of each month's operations. The first of these statements will appear during the early part of March, dealing with the results for February.

TOPICS OF THE WEEK.

THE MINING INDUSTRY IN THE UNION ASSEMBLY.

Though the Union Parliament has already begun its sittings and the general outline of the Government programme is known, it will be some days before the details of the new legislation affecting the mining industry are announced. Comment has already been offered in these columns on the special war taxation which General Smuts has planned, and which all parties have accepted in advance. Other features of the new Budget and coming war legislation affecting the mines have received scant attention, and something may usefully be said regarding the intentions of the Government and the discussion they may provoke in the Assembly. As far as direct State financial assistance to small mines in the "outside" districts goes, there is reason to believe that the sum which it has been customary for the Government to vote of recent years for this purpose will be considerably cut down. Though the need for money to repair roads and drifts was never in recent times greater, the Government regards the claims of economy as so insistent that a mere nominal sum to keep alive the sub-vote heading of "assistance to outside mines" is all that may be expected. By way of compensation, it may be hoped that the Minister of Mines will ask for and obtain from Parliament power to alter that portion of the Gold Law which insists, even in the face of circumstances like the present, on the claimholder paying up full claim licences without monetary rebate or extra extension of time. Mr. Malan has listened to numerous deputations on the subject, and he, better than anyone else, knows the real danger of inflicting great hardship upon long-suffering claimholders by a strict insistence upon the letter of the law. If Parliament can hurry through—as it did in the last session—a Moratorium Act to relieve the financial worries of the farmer, surely it is not too much to ask that the same consideration be extended to the struggling claim-licence payer in the outside districts? If the responsible Minister fails to bring the matter up in the House, we trust some of the progressive members who hold the small man in mining no whit less deserving of support than his bucolic brother will fill the breach. The Mines Department, like other departments, we understand, is making strenuous endeavours to reduce expenditure, and it is a sign of the times that the comprehensive and invaluable annual report of the Department, from whose rich storehouse of facts and statistics we were wont to replenish, annually, our pages, is this year, by the fiat of the financial pruner, to be denied us. It may be hoped, however, that the Department will enlist the always willing aid of the Press—our own pages are always in waiting for such excellent "copy"—by vouchsafing to grant access to the rich stores of technical information garnered by the indefatigable inspectors of the Department, crowned, of course, by the mature and well-informed views of the Government Mining Engineer himself. The most important matter of all we have left till last. Though there has been delay in reaching a decision in regard to the action that should be taken by the Government to throw open the promising areas of the Far East Rand, there is no doubt that the issue will not be further shirked, and the present session should see something tangible done. It is recognised in the highest quarters that if the Rand is to be spared the ill-effect of a diminishing gold output, with all its correlated evils of declining trade, poverty, and shrinkage of employment, a start must be made, without further delay, on the great work of initiating mining operations on the far eastern area. The bogey has been raised that the necessary capital may now be difficult to attract, but London, with the magnificent fruit and blossom of the Rand before it in the tangible shape of a £22,000,000 contribution to the gold reserve of the Bank of England, is not likely to begrudge us the money to make a beginning with the working of our untapped areas. Nor will the Special Committee appointed by the Imperial

Treasury prove other than a real help if the names and past records of the financial experts composing it go for anything. Therefore, we look with confidence to the Government in the present session to make an announcement in this direction, and thereby increase public confidence in the ability of the Union to rise to the needs of the crisis, and improve the credit of the country as nothing else can. Though, from the economic standpoint, the Union Assembly in this session will be the poorer by the loss of such authorities as Sir Lionel Phillips and Mr. Drummond Chaplin, we can count upon the remaining members for urban and industrial constituencies keeping the House alive to the need for an early decision on this matter. The very fact that in these unexampled times none are for the party and all are for the State should ensure the minimum of obstruction for the acceptance of so constructive and urgent a proposal.

THE WAGE PROBLEM ON THE MINES.

Despite the numberless reports and recommendations of Committees on the subject, the whole problem of payment for white and black men's services on the mines is still in the melting pot. To give but two instances from the annual report of the Mine Managers' Association, in August last the question of arriving at some satisfactory method of fixing and regulating the rates for piece-work tramming and shovelling was referred to the Association by the Committee of Consulting Engineers, with a view if possible to recommendations being submitted on the subject. The question was gone into at length by the Association, and a report containing their views on the matter was duly forwarded to the Committee of Consulting Engineers. Again, owing to the fact that it was found that a large percentage of machine and spanner natives were content with the present minimum wage paid for these classes of work, with the result that they did not try to get a reasonable day's work done and it was thus difficult to increase the machine efficiency or to maintain present efficiency on some mines, a communication has been recently addressed by the Association to the Native Recruiting Corporation, Ltd., submitting that it is desirable to alter the present rates set down for machine boys so as to provide for a minimum task for such boys and a rate of pay commensurate with such task. The question of a uniform system of the white miners' pay has also engaged the serious consideration of mine managers of late. Last year a sub-committee of the Association was appointed to go into the matter, and a report, which included recommendations for the abolition of the flat contract and the uniform substitution therefor of the day's pay plus bonus or contract system, was drawn up and submitted at a special meeting of the Association held that same month. With certain modifications the report and the recommendations contained therein were adopted, and forwarded to the Committee of Consulting Engineers. A joint meeting of representatives of both bodies subsequently took place, when the views of the Association were put forward in detail with the object of enlisting the support of the Committee and of a general agreement being arrived at on the lines of the recommendations put forward. The Committee was, however, unable to come to an unanimous agreement in the matter. The conclusions arrived at by the Association were to the effect that the advantages to the industry obtained by the more even distribution of pay under the day's pay plus bonus or contract system would be greater than any loss in efficiency occasioned by the abolition of the flat contract, and the meeting agreed with these views. Pending, however, the issue of a report involving amongst other matters the consideration of the comparative merits of various systems of pay on which the Association was engaged, it was decided, before taking any further action in the matter, to await the completion of that report. There, for the moment, the matter rests. Is it too much to hope that a uniform system may be agreed upon during the current year?

THE MINE MANAGERS' SPHERE.

Our sympathy always goes out to the President of the Mine Managers' Association, because he is called upon to give his annual public address just previous to that of the President of the Chamber of Mines and of a host of lesser celebrities presiding at the yearly gatherings of their shareholders. The trouble is to interest one's hearers by new facts and figures without monopolizing all there is to say about the lessons of the year that is past. Sympathy this year is coupled with admiration for Mr. Palmer Carter's successful and attractive treatment of the many phases of the mining industry he touched upon, without, however, in any way exhausting them. Native labour bulks largely in the Mine Managers' purview during the year on the Rand, and Mr. Palmer Carter showed himself, like Mr. Warriner, far from satisfied with the present amount of work rendered by the native. Without offering any ready-made solution of the problem that has puzzled the fields for so long, Mr. Carter seems to think that time coupled with the growing needs of the native will provide the incentive, now so signally wanting, to induce him to put forth efforts commensurate with his potentialities of strength and skill. Mr. Carter's references to the improvement in the lot of the white miner, his holidays and health conditions underground, make cheerful reading, and give the lie to the croakers who hold that labour unrest on the Rand has but been scotched and not killed.

By far the most interesting feature of Mr. Carter's address, to our mind, was his reference to the appalling cost of accidents on the mines of the Rand. Mr. Palmer Carter's estimate doubtless referred to the direct loss to the mines represented by the compensation paid. That figure certainly does not fall below £130,000, and the direct cost is, of course, the least serious item in the bill. In addition, there is the damage caused to plant or machinery, and the loss due to time wasted, efficiency lessened and the innumerable corollaries of accidents. In the case of natives, there is the serious monetary loss of recruiting fees and transport charges. Without attempting to follow the loss through all its cumulative consequences, it may be estimated that the total of both the direct and indirect cost of accidents to the mines of the Rand cannot fall far short of £500,000 per annum, or the amount the Government, by all accounts, intends to add to the profits taxation of the industry during the war period! We have not hitherto emphasised the monetary side to the campaign against accidents, but Mr. Palmer Carter's remarks compel thought, and throw a lurid light on the waste of human life, efficiency and money caused by accidents on the mines. Fortunately, the accident death rate for the Rand in 1914 was 3·22, showing a very material reduction—and making a record for these fields. Credit for that record is largely due to the efforts of the "Safety First" Committee of the Rand Mutual, and the Government Mining Engineer informed us during the week that he fully endorses this view. Mine managers doubtless in the light of the figures quoted, regard "Safety First" as "good business," as well as sound solicitude for the conservation of human life.

Indeed, the fact stands out clearly in the President's address and the annual report of the Mine Managers' Association, that it is chiefly a business body concerned mainly with the hard practical facts of everyday mining. Its monthly meetings are devoted entirely to the consideration of the business of managing mines on the Rand, and now that the question of status has been satisfactorily settled, we may expect the views of the Association to influence more largely than ever the conduct of the industry. At the meeting last week, Mr. Percy Cazalet, who has served the Association long and faithfully as hon. treasurer, suggested that its scope should be extended to include managers of mines anywhere in South Africa. The proposal strikes us as an excellent one, quite in harmony with the liberal and progressive spirit of the times. In Mr. Pam, the new President, the Association certainly has a leader and guide who can be trusted to study and advance its best interests in the present year.

RAND ORE IN DEPTH.*

A Reply to Mr. Rickard—Subject for Enquiry by Commission –Lessons from Rand Experience—Promise of Far East Rand.

By Hans Meyer.

We can regard it as a great privilege that we are able to produce in our journal Mr. Rickard's paper on the "Persistence of Ore in Depth." The paper must be of the greatest interest to mining engineers all over the world, as I venture to say that few would care to deal with so contentious a subject, especially as it deals with every field of economic importance. We here, who have for the most part spent the whole of our useful careers on the Witwatersrand, must naturally turn to that part of the paper which deals with the fortunes of these fields. Mr. Rickard, I think you will agree, dooms us to comparatively early extinction, and illustrates his views by calling attention to the results obtained from the deepest mines, viz., the Cinderella Deep, Simmer Deep, Jupiter, and Village Deep. He also quotes H. H. Webb on the experience gained from the mines to which he was Consulting Engineer, *i.e.*, quoting the words "our experience of our mines." This appears to me to be generalising on a basis of particular areas. We have on these fields a strike of fifty-five miles, with mines of varying values, and it must be obvious that a thoroughly scientific statement on the subject under discussion would entail a most elaborate investigation and the collection of a mass of figures and data. I am, therefore, afraid that at this meeting no one will be able to contribute anything which will be of real value as a contribution to the discussion of the paper. Further, no individual member can properly deal with this subject, as it involves so many different interests. Mr. Rickard calls on Mr. Marriott to "make good." I am afraid it would be necessary to appoint a Commission which would have access to all data before any definite result could be obtained.

Some Instances of Improvement in Depth.

It is quite possible to select definite areas on the Rand where values have decreased in depth, perhaps not in a regular manner, but nevertheless on the whole. The reef bodies are quite "persistent," but they do not yield the same profit as nearer the outcrop. On the other hand, the opposite has happened. I will take a few instances to emphasise my point. At the Durban Roodepoort, for many years, the South Reef only was worked. This was quite rich, and there is always a tendency to measure the productivity of a mine by its palmiest days. Of late years, the Main Reef has been consistently mined, and its value is lower. The eventual grade of this mine will be the average of the two. The Deep Level mines both reefs at the same time, and therefore has a lower grade. Coming eastward, I believe that the deeper portion of the Consolidated Langlaagte is as good as the outcrop; the same applies to the Consolidated Main Reef. Coming to the Central Rand, there is a rather wider variation, and in many cases it appears that the deeper mines are poorer. This is based on definite results, but there are good reasons which perhaps are not quite apparent at first sight.

The Period of Ultra Selective Mining.

In the early history of these fields, the expenses of mining were very high; it was the object of every manager to produce the highest yield possible, and the period could be described as one of "ultra selective mining." Most mines, even in those days, were "two reef" mines and sometimes three, but the best reef was invariably selected for exploitation, and the others, after a small amount of prospecting, were left to the successors. We are the successors. The outcrop mines are, therefore, always considered on the basis of their best days, but all of you know that the reefs left behind by our predecessors have been successfully dealt with, and the productivity per unit of area has been largely increased. The average grade, however, is naturally much lower.

Deep Level Mining Practice.

In the case of the deep levels, the procedure adopted in the outcrops has been impossible and uneconomical. We have been fortunate in reducing the operating costs by better and more economical planning, the properties are larger, and in most cases it has been found the best policy to mine systematically. I do not wish at this stage to discuss the question of selective as against wholesale mining: it is so entirely dependent on the particular conditions. It is scarcely necessary for me to remark that no man, with his eyes open, deals with ore that cannot show a profit under the conditions of working. But the final result is that we are gradually obtaining an average yield which has not yet been determined for but few of the outcrop mines.

The Real Problems of the Rand.

Generally speaking, from my own experience, I find that the rich sections of our outcrop show some persistence in depth; if they do not indicate the same richness they are still quite profitable, and the engineer here is faced more with the difficulty of dealing with high temperature and heavy pressure than with the persistence of values. In these brief remarks I am unable to deal with any specific figures, but merely wish to point out a few peculiarities of these fields as compared with others where perhaps the facts are more obvious. When fuller development has taken place on the Far East Rand, it may be a matter of surprise to the author of the paper that better results are obtained at depth than from the outcrop. So far, the tendency appears to be in this direction. In closing these remarks, I would call the author's attention to the fact that the Village Deep is not the deeper portion of the Ferreira Deep nor of the Ferreira—it is the deep of the Salisbury and Jubilee and Village Main Reef Companies.

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*Read before the Chemical, Metallurgical and Mining Society of South Africa.

Mr. E. Pam, Manager of the Geldenhuis Deep, has been elected the new President of the Mine Managers' Association of the Transvaal, and Mr. J. E. Healey (Neumann) was chosen as Vice-President. The following were elected to the Council: Messrs. A. J. Brett (Central Mining Rand Mines), E. H. Bulman (Anglo-French), C. R. Davis (Consolidated Mines Selection Company), H. G. Nitch (Albu), E. C. Meyer (E.R.P.M). A. E. Payne (Barnato), J. R. Thom (Anglo-French), F. J. Trump, A. J. Walton (Central Mining-Rand Mines), J. J. Wessels (Gold Fields), and C. B. Saner.

New York Life Insurance.

The London office of the New York Life Insurance Company has received from the head office at New York a summary of the annual report for the year ended 31st of December, 1914, which shows that new insurances amounted to £15,910,861, a decrease of £2,111,810 (exclusive of revived and increased insurances and additions. Policies in force number 1,142,253, increase, 10,598; insurances in force £482,297,088, increase £15,205,911; liabilities, as per State valuation, £158,071,390, increase £6,505,135; assets, as admitted by State Insurance Department, £162,526,537, increase £8,726,304, income for year £25,893,272, increase £364,212; death claims £[illegible],398,080, increase £61,851; cash bonuses paid £3,518,118, increase £115,981 reserve for bonus distributions and contingencies £21,155,118, increase £2,197,230

THE STUDY OF ORE DEPOSITS IN SOUTH AFRICA.*

(By DAVID P. McDONALD.)

At one of the earliest meetings of the Geological Society of South Africa some of its enthusiastic founders expressed the opinion that the scientific researches of the members ought to be in part at least directed towards geological problems which have a practical application. There was, in fact, a natural desire among thase Transvaal pioneers into the realms of Geology, many of whom were interested in the exploitation of the mineral resources of the country, that Economic Geology especially as applied to mining should frequently provide material for description and discussion. That encouragement in the study of subjects which were not considered of immediate practical importance, but of only scientific interest, was, however, not lacking, is plainly disclosed in the early volumes of the "Transactions." It is, indeed, often difficult to decide what is practical and what is not. That a discovery of purely scientific interest to-day is to-morrow a factor of economic importance is true in Geology as in any other science. The student who intends to seek for gold in the Archaean schists, regards as futile the laborious task of the palacontologist who observes and records the minutest differences in the structures of long extinct animals; but, when the mining engineer engaged in the search for deeply buried coal seams is enabled to determine by means of the despised fossils the most favourable horizons for his operations, the value of such work at once rises in the estimation of its former critic. So with many of the problems in ore-deposition. To some the study of the genesis of an ore appears to be of theoretical interest only. It is not an uncommon experience to get a gentle hint from the man engaged on the mine that no doubt such a question is very interesting to people who have nothing better to do, but that he is too busy following the " values " to give much time or attention to such a matter. There is a certain expression of failure to grasp the idea that the following of the "pay-streak " and the finding of other " pay-streaks " may be facilitated by deductions from the genesis of the ore. Many of the results obtained in such a study may always remain of interest to the theorist alone, but there are, of course, already many instances of results becoming valuable practical assets. It may at any rate be assumed from the nature of the Transactions that in the opinion of the early members of this Society the study of everthing associated with ore and ore-deposits was considered of a practical nature, so that, when I attempt to trace the progress in that subject which has been made by our members, I shall be determining in respect of one branch of our subject to what extent the desire of the founders of the Society has been fulfilled. South Africa with its varied deposits of gold, copper, tin and other metals has offered splendid opportunities for research work in this branch of Geology. The Transactions of the Geological Society and the memoirs of the Geological Surveys give convincing evidence that they have not been neglected. As a result of twenty years' close attention to the geological aspects of the different types of ore-deposits not only are the general characters of most well known, but in many cases the minutest details have been examined and described. It appears to me, therefore, that there will be in the near future a marked change in the nature of contributions on ore deposits. We must look forward to obtaining much more information of a detailed character. Intensive study of individual deposits must replace to a great extent the more attractive comparative accounts, and, since we have now reached the stage when this change will become more pronounced. I thought it might be of interest to review the work which has already been done. It is not my intention to compile a complete list of the papers dealing with South African ore deposits but rather to comment on the results which have been achieved. and to mention some which I would like to see attained and recorded in the Transactions in future years.

GOLD DEPOSITS.

From the commencement of the Society's activities the problem of the banket have attracted the attention of members; and, in particular, the origin of the gold has been the subject of discussion on many occasions. In the course of time a vast fund of knowledge regarding the gold-bearing conglomerate has been accumulated: its comparison, its structure, the nature of the mineralogical changes which have affected it, have all been the objects of the most elaborate investigation. Nevertheless, owing to differences of interpretation given by the different observers, the controversy still continues, and to-day we find that the very problems which occupied the attention of Draper and Sawyer at the very start of the Society's career, will again soon be the subject of discussion at our meetings. To a certain extent the history of the controversy on the origin of the gold is to be found in the Transactions of this Society, and it is fitting that the last word in the argument should find its place there. As you are aware, Mr. C. Baring Horwood has recently revived the question in his series of articles to the " Mining and Scientific Press." Mr. Horwood is a strong supporter of the infiltration theory which has for long been upheld by South African geologists, including Dr. Corstorphine Dr Hatch and Dr. Young. It is very interesting to note that in a contribution to the discussion of Mr. Horwood's paper Dr. Mellor[1] has declared in favour of the placer theory. When, therefore, Dr. Mellor presents his next paper to the Society I hope that he will take the opportunity of including a section containing his views on the genesis of the gold. That he should do so, is all the more desirable in view of another paper which is at the moment the subject of much attention. I refer to Mr. Rickard's paper, " Persistence of Ore in Depth."[2] Mr. Rickard claims that the Rand provides examples clearly in favour of the theory that gold deposits show impoverishment in depth, and that, therefore, on the Rand, as on any other mining field, the persistence of ore in depth is at any rate exceptional. Whether the average assay values taken over the whole field bears this out I do not know: but it is certainly true that, if the gold in the banket was not carried to its present position by magmatic solutions, but was deposited as detrital gold along with the peebles and sand of the rock, any analogy from the more ordinary types of gold lodes does not hold. It may be a fact that such deposits almost invariably become impoverished in depth, and yet such a result need not necessarily be expected on the Rand. Mr. Rickard's argument is complete, so far as the Rand bankets are concerned, only if it be accepted that the gold in the banket was introduced under conditions similar to those existing during the mineralisation of the ordinary type of reef. If the gold in the banket was originally placer gold, then any general conclusion based on the evidence of lodes in which the gold has been deposited from ascending solutions rising from some deep-seated source, does not apply to the banket. The difference in the genesis of the gold at once introduces a distinguishing factor. Whatever theory is held as to the origin of the gold, all are agreed that there has been a considerable redistribution of the gold content owing to solution and reprecipitation. Dr. Mellor, however, is apparently of the opinion that the migration of the gold has never produced more than local effects, so that the present distribution of the gold in the bankets may be regarded as corresponding fairly closely to the original. Accordingly on this view the persistence of ore in depth on the Rand depends on factors essentially different from those regulating the persistence of values in an epigenetic gold reef. In order to forecast the persistence or non-persistence of ore in the bankets it is necessary to discover the conditions under which the conglomerates were laid down and what compelled the deposition of the gold over certain areas of the pebbly beach. The problem shifts from ascertaining whether the gold was contemporaneous or subsequent to the determination of the geographical and physical conditions during the period of deposition of the containing rock. I fear that I have for the moment abandoned the historical in favour of what lies in the future; but the future will really be in part also a revival of the past, because such questions, as I have suggested, were themselves subjects about which members of the Society speculated in the early days of geological research on the Rand. On account of the fact that the banket reefs are of a stratiform nature their study gave the needed impulse to the study of stratigraphy. There was a natural passage from the treatment of the bankets as ore-deposits to their examination as integral parts of a series of strata, the geological relationship of which was a matter of the greatest economic importance. At a very early date, therefore, attempts at the elucidation of the geological structure of the neighbourhood were made, and we find a constantly growing literature on the bankets, some of which is devoted to the wide relationship of the reefs as strata, some to the minute details of the banket as an ore. Neither side of the subject is yet exhausted, for we are still waiting for the completion of Dr. Mellor's exhaustive survey, when we may hope to see a great revival of interest in several of these questions.

(*To be continued.*)

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* Anniversary Address by the President of the Geological Society of S.A.

[1] Mining and Scientific Press, May 6, 1914.

[2] Inst. of Mining and Metallurgy, Bull. No. 122.

Namaqua Copper.

Abstract from the superintendent's report for October, 1914 :—Tweefontein Mine : No. 1 shaft, 58 fathom level east, cross-cut north of—driven 20 ft. Total length 155 ft. The ground is still carrying fine particles of copper, but not enough to value. 58 fathom level east, cross-cut north, No. 97 winze—sunk 10 ft. 6 in. This is being opened up at 65 ft. behind the end, to trace a number of small veins of copper. 58 fatham level east—driven 8 ft. 6 in. Total length 637 ft. Driving has been resumed to prove the ground beneath the 53 fathom level. 53 fathom level east, No. 96 winze—sunk 14 ft. Total depth 28 ft. 6 in. Sinking was stopped about the middle of the month, the winze having passed through the vein of 6 p.c. ore previously referred to. No. 2 shaft, 168 fathom level, west of No. 78 winze: Cross-cut north of No. 5 rise—driven 9 ft. in ground mineralised throughout, and containing about 2 p.c. copper. 160 fathom level, N.W. of No. 78 winze—driven 8 ft.; total length 12ft. 6in. The lode is well defined, and not without promise. 95 fathom level west—driven 8ft.; total length 1,050 ft. Mineralised ground still extending. Driving was suspended early in the month on account of being short of hands. Henderson's Mine : No. 1 level, east of stope—driven 17 ft.; total length 101 ft. A branch of the lode having gone off to the S.E., a cross-cut has been started and 4ft. 6in. driven in ground carrying patches of 2½ p.c. ore. 30 fathom level, cross-cut south—driven 16 ft. Total length 115ft. 6in. Ground still slightly mineralised.

ANSWERS TO CORRESPONDENTS.

A number of replies to correspondents are unavoidably held over.

THE UNION'S NEWEST DIAMOND FIELDS.

An Account of the Diamondiferous Areas of the South-West Coast.

THE appointment of an official of the Union Department of Mines at Luderitzbucht will help to bring home to residents of South Africa the fact that Union forces are now in possession of the extensive diamond fields of the German South-West Colony. It is now ancient history that in the middle of September our troops occupied Luderitzbucht, the ugly Teuton town situated on Angra Pequena, or "little bay," and that since that date the forces under the command of General Sir Duncan Mackenzie have so advanced into the interior and patrolled the coast that the whole area of diamond-bearing sand is now under Union control. Thus the only competitive factor of any material consequence to South Africa's monopoly of the world's diamond trade has disappeared, and it may to-day be asserted that the Union has command of all of the sources of diamond production known to exist in the entire world. At the present moment the diamond industry is absolutely stagnant. The Kimberley mines and the Premier ceased production almost directly after the outbreak of war. Along the river diggings the industry has for months past been at a standstill, and the majority of the diggers are now on active service. It will, of course, take a long time for the diamond industry to regain its former position. But sooner or later, after the ravages of war have ceased, diamonds will again prove attractive, and it will then be appreciated that control of the German South-West African fields is of no small importance and significance to this country. Luderitzbucht, the chief town and centre of the German South-West Fields, is a well-built place situated amidst most uncongenial surroundings. It contains numerous offices, stores, etc., some of which are exceedingly well constructed, notably those of the Deutsche Diamanten Gesellschaft. At the time of occupation by the Union troops this company had accumulated in Luderitzbucht large quantities of concentrates containing diamonds. The chief productive area is at Kolmanskop, situated nine kilometres inland from Luderitz Bay. Charlottenthal—a similar distance from Luderitzbucht, but situated to the north, is another centre of production, and at both of these places there are large quantities of valuable machinery, and at Kolmanskop extensive buildings.

Before proceeding to deal with these areas, a brief description of the topography and outstanding geological characteristics of the littoral is called for. The diamondiferous deposits of German South-West Africa extend along the coast for a distance of nearly 300 miles. This tract of country is surely to be reckoned amongst the most bleak, inhospitable and ugly on earth. It is waterless and almost continually swept by south-east winds, which raise huge clouds of coarse sand and make the conditions of life most uncomfortable. These winds—blowing throughout the centuries—have been a factor of major importance in the topography and geology of the country, since they constitute an agency of denudation of tremendous force. Inland from Luderitzbucht—that is to say, to the east of the town—the influence of eluvial agency can be studied to great advantage, more so, perhaps, than in any other place on earth. Between Luderitzbucht and Kolmanskuppe, a distance of nine kilometres, is a strange jumble of ancient crystalline rocks, notably gneiss and augen-gneiss. There are numerous ridges of these rocks cut and seared in places by granite and veins of quartz. The structure of the majority of these rock masses is most extraordinary. The violent gales have by attrition worn away the gneissoid and granitic ridges to ridges as sharp as a knife edge. In other places the ridges have assumed all manner of fantastic shapes, and are sometimes serrated like the teeth of a saw, or, again, the rocks may be hollowed out to form caves and caverns. Soon after the discovery of the Fields in 1908 the theory was advanced that the diamonds owed their origin amongst the sands and gravels of the littoral to the violent winds, which, it was suggested, released the gems from the basement crystalline rocks by denudation and weathering. Further investigation of the Fields has, however, led to this theory being dismissed as untenable. The absence of gems in the detritus derived from the basement rocks is certainly at variance with the thesis of eluvial origin. The theory that now finds most support is that the diamonds of the German South-West African Fields originated from primary deposits which are now covered by the sea somewhere in the neighbourhood of Pomona, which is about forty miles to the south of Luderitz Bay.

The properties at Kolmanskop and Charlottenthal are situated on the eastern flanks of these rock masses. There is here a depression running with a north and south strike bordered on one side by the crystalline ranges of the seaboard and on the other side by the sand dunes, which rise to great heights and run parallel with the coast line, and about ten miles inland from the sea for at least 200 miles from Angra Lunta, or nearly to Walvis Bay. As evidence of the strength and intensity of the winds of German South-West Africa, it may be remarked that these dunes may move as much as eighty or ninety feet per month, so that in a comparatively short space of time the topography of the whole sand dune country may change greatly. Kolmanskop is an important railway station—as railway stations go in German South-West Africa. The line from Luderitzbucht to Keetmanshoop passes below a sandy ridge on which are situated the well-built residence of officials of the company. Journeying from Luderitzbucht through the ugly, rugged rock masses that wreath Luderitz Bay, the sight of stately double-storied residences out in the illimitable sand belt comes as a startling revelation. Between these houses and the railway station are large workshops containing much valuable machinery, and to the south-east of the ridge is the equipment of the Kolmanskuppe Company with elevator and extensive galvanised iron buildings. At Charlottenthal the buildings and equipment are not so extensive as at Kolmanskuppe, and this latter area appears to be more of a "small man" field, in which comparatively unimportant syndicates are operating than the former. But at least one important concern was at work there previous to the British occupation. Naturally, the working of these superficial deposits is not an expensive matter, and it has been fortunate for the more established diamond-bearing areas of British South-West Africa that the yield is not very high, and that the diamonds are invariably of small size. Had this not been the case, the Luderitzbucht-Pomona gravels might have very seriously affected companies like De Beers, the Premier, and other leading concerns of the Union. On account of the sporadic distribution of the gems in the gravel sampling or testing which will give any reliable results is difficult. Trenching appears to be the method most generally employed. Provided indications are favourable, excavation of gravel for purposes of treatment is generally carried out in a crude manner by means of ordinary hand shovels, but in the case of the Koloniale Bergbangellschaft Company the gravel is "mined" by means of large electric shovels which load into side-tipping trucks. The Kolmanskop Company also used electrically operated shovels. After excavation, the gravel is screened by means of sieves or trommels. The fine sand is thus eliminated, and a roughly sized product is obtained for concentration in jigs or Schiechel separators. Probably the largest concentration plant in the country is that of the Koloniale Bergbangellschaft at Kolmanskuppe station. This concern is one of the most important in German South-West Africa, the other principal companies operating in the neighbourhood of Luderitz Bay just prior to the outbreak of war being the Kolmanskop Diamond Mines, Ltd., the Deutsche Diamanten Gesellschaft, and the Vereinigte Diamantminen. The Koloniale Bergbangesellschaft erected a large electric generating station at Luderitzbucht, and most of the companies operating in the neighbourhood obtain power from this. Scarcity of water has, of course, always been one of the great difficulties of this exceptionally arid region. The Koloniale Bergbangesellschaft has been forced to pump water from Elizabeth Bay, seventeen miles distant. Drinking water is derived from the Luderitzbucht condensing plant.

ASSOCIATION OF MINE MANAGERS' ANNUAL MEETING.

Presidential Address by Mr. Palmer Carter—Light on Present-day Problems of the Industry—Success of the Sanitation and Safety Campaign—All-Importance of Working Costs—Drawbacks of Native Pay System—Improved Relations with the White Workers—A Notable Tribute to the British Navy.

In moving the adoption of the report of the Council at the annual meeting of the Association of Mine Managers, held at the Chamber of Mines last week, the President, Mr. Palmer Carter, stated that the question of the status of the association in matters connected with the mining industry had been amicably settled, and the association now stands on a firm foundation. The year showed the usual labour shortage, the monthly average of natives employed on mines and works in the Transvaal being 193,127, as compared with 211,029 in 1913. More attention than at any time previously had been paid to medical inspection of natives, and the death-rate from disease showed a still further improvement. The figure of 15·22 per thousand constituted a record. The percentage of natives working has averaged as high as 97 to 98·5 for the year on some mines. But the trouble was not to get the native to his work, but to get a higher working efficiency out of him. Even with the incentive of no limit on his earnings, the hammer boy, who is privileged to work on contract, is content with an average of about 2s. 5d. per shift. The introduction of a system of piecework for natives on tramming and shovelling, which has been generally introduced, has tended to increase the average pay without a corresponding increase in the native's efficiency. There had been the same experience with machine boys. The South African native has not yet learned to appreciate fully the advantages to himself of working on a contract or piecework system.

STANDARD OF £3.

The majority of underground boys are content with a standard of earnings of £3 per month. A more satisfactory arrangement has been arrived at in regard to the fixing of native labour complements. The complements are now to be determined and fixed by two independent technical men, two of the best and fairest that could be found, who have had a large experience on these fields. The question of a uniform system of pay for underground men on contract has not yet been settled on these fields. The Association has recommended the abolition of the flat contract and the uniform substitution therefor of the day's pay system, with the main purpose of having a more even distribution of pay than under the flat contract system

WHITE LABOUR.

The concession granted to the underground men by the mining companies after the July, 1913, strike, of ten days' holiday on half-pay to each man who has been in the company's employ a full year came into effect during the year. The granting of ten days' holiday a year on half-pay to surface men after two years' service will begin in July of this year. This concession of the mining companies of the Rand to the employes with reference to holidays is to be highly commended, and the President said he had yet to hear of any mining fields in the world which have introduced such excellent and commendable holiday regulations for all their employes as are to be found on the Rand. The elimination of dust in the underground workings and crusher stations has received every attention during the year. The sampling for dust in mines and crusher stations of the Witwatersrand mines under the ægis of the Government Mines Department and the Miners' Phthisis Prevention Committee was completed during 1914 so far as the committee was concerned, and gave on the whole very satisfactory results—namely, 5·4 mgs. of dust per cubic metre, average. The sampling of mine dust is now being continued by a staff of samplers appointed by the Transvaal Chamber of Mines, and every mine on the Rand is being sampled from time to time. It is difficult to see how, with the hearty co-operation of all concerned, the elimination of underground dust should not be an accomplished fact, and the dread disease of miners' phthisis abolished from the Rand. Health conditions, both underground and on the surface, have never received more attention than they are having to-day. The advance made in dust prevention and better ventilation underground during the past two years has been enormous.

SAFETY FIRST.

The strength of the movement is undoubtedly growing, and the Association is working in close co-operation with the Accident Prevention Committee of the Rand Mutual Assurance Company. As a purely economic question the accident rate is one of the most important on a mine. Accidents on the Rand are costing the mining companies some £125,000 per annum, and apart from the humane side of the question it will certainly pay in every way to strive for a further reduction in the accident rate. The accident rate for whites and natives on Transvaal mines for the year 1914 was 3·05 per 1,000, and for the Witwatersrand mines alone 3·22 per 1,000. These figures show an encouraging improvement, and are the lowest on record for these fields. The manager requires the loyal and constant support of all underground and surface officials, so that workmen who carelessly and indifferently endanger the safety of themselves and others may be dealt with under the law.

WORKING COSTS.

In the whole question of profits versus costs, working profits are vastly more preferable and important than low working costs at a sacrifice of profits. Working costs on the mines of the Witwatersrand for 1914 show an improvement at 17s. 1d. per ton against 17s. 11d. for 1913, a decrease of 10d. per ton, which is encouraging. Two of the greatest items in the reduction of working costs which should be striven for, but the saving in which at present seems a long way off, are the cost of recruiting native labour on these fields and the cost of miners' phthisis to the mines, which amount respectively to many hundreds of thousands of pounds per annum. There is no doubt that at this stage of the Rand's history the question of working costs assumes a more important position than ever before. To-day there are thousands of tons of reef in these mines of too low a value to be mined at present rate of costs, but in the reduction of each shilling per ton in working costs thousands of tons will be admitted into the zone of payability, and the life of these fields thereby increased. The mine managers have a great part to play in the reduction of these costs, and all feel this responsibility to the fullest extent.

TAILINGS DUMPS.

Efficacious means of covering tailings dumps to prevent the sand from blowing about have been perfected, and the prospects are that in time the sand blowing from the dumps will be decreased considerably. The President added: "I am afraid, however, that we shall still have the surface dust fiend with us until the roads of Johannesburg and surrounding districts are also made dustless by some efficient means. If the dust problem on the surface could be handled as efficiently as it has been underground we should always have a pleasant atmosphere to live in." There is no reason to complain of the lack of martial spirit amongst the mine employes. The mine managers' chief difficulty in this respect has been to curb the spirit of those wishing to enlist and to try to get them to see that their duty was just as imperative towards doing their part in keeping the mines on these fields going as it was to enlist. Over 10 per cent. of the total employes on the mines have joined the forces. In conclusion, the President said: "In the troublesome times through which the world is now passing —with the greatest war in history being waged —I think one of the most striking tributes to the greatness of the British Empire is the way this huge mining industry, which is turning out 40 per cent. of the total gold output of the world, is being kept going at full pressure. This is in a large measure due to the 'watch dogs' of the ocean, the British Navy. I feel sure the mine managers of these fields will join me in taking off our hats to the gallant men who are making it possible for us to keep that industry going."

THE WEEK IN THE SHAREMARKET.

A Steady Improvement—Specialities in Demand—Far East Rands in Favour. Collieries Better.

THE volume of business put through the local sharemarket this week was not large, but there has been a steady rise in quotations. The new Union taxation appears to have been discounted, and the arrival of £22,000,000 of Rand gold in London has had an excellent effect. Dividend payers have been quietly picked up, and Far East Rand stocks are better on the renewed hopes of Government taking action to facilitate development in that area. Tins have shown more activity in keeping with the change in the price of the metal, but diamonds remain unnoticed and uncared for.

	Fri., 19th.	Sat., 20th.	Mon., 22nd.	Tues., 23rd.	Wed., 24th.	Thurs., 25th.
Adair-Ushers	—	0 4*	0 4*	0 3*	0 6†	0 4*
African Farms	9 0*	9 2	9 1*	9 2*	9 2*	9 1*
Apex Mines	13 0*	13 3*	—	14 0	14 0*	13 9*
Aurora Wests	10 0†	—	—	—	—	—
Bantjes Consolidated	9 3*	9 6*	10 0*	10 0*	10 0*	10 3
Brakpan Mines	—	—	45 0*	45 0*	45 6*	45 6*
Breyten Collieries	—	20 0*	20 0*	—	20 0*	20 0*
British South Africa	26 0*	—	—	—	—	—
Bushveld Tins	0 4*	0 5*	0 4	—	0 5*	0 5†
Cassel Coals	11 0*	11 0*	11 0*	—	—	11 0*
Cinderella Consolidated	3 9*	—	3 0*	3 9*	3 9*	3 9*
City and Suburbans	44 0*	44 0*	44 3	44 3	44 0*	44 3
City Deeps	55 3*	55 6*	54 0*	54 0*	54 0*	55 0*
Cloverfield Mines	4 1*	4 1*	4 1*	4 1*	4 1*	4 1*
Clydesdale Collieries	—	—	—	8 0*	—	—
Consolidated Investment	—	—	—	—	16 0†	—
Consolidated Langlaagte	32 0*	32 0*	32 0	32 0*	32 0*	32 3*
Consolidated Main Reef	16 9*	16 9*	16 6*	17 3	17 6	17 3*
Cons. Mines Selection	8 3*	8 3*	—	—	—	8 3*
Coronation Collieries	—	—	21 6*	21 6*	21 6*	21 6*
Coronation Freeholds	—	—	—	0 3*	—	—
Crown Diamonds	—	—	1 6*	1 6*	—	—
Crown Mines	75 0*	75 0*	76 0*	77 6*	—	76 0*
East Rand Centrals	2 0*	2 3†	—	—	—	2 0*
East Rand Coals	1 5*	1 4*	—	1 5*	—	1 5*
East Rand Deeps	1 4*	1 4*	1 4*	1 4*	1 4*	1 3*
East Rand Props.	27 0*	27 0*	27 6*	27 3*	27 3*	27 0*
East Rand Debentures	£87½*	£87½*	£87½*	£87½*	—	£87½*
Eastern Gold Mines	1 1*	1 1*	1 1*	1 1*	1 1*	1 0*
Ferreira Deeps	44 0*	45 0a	—	—	45 0*	—
Frank Smith Diamonds	—	1 3*	1 3*	1 3*	1 4	1 3*
Geduld Proprietary	20 9	20 9*	21 0*	21 3*	21 6*	21 9
Ginsbergs	13 6†	—	13 6†	—	—	13 6†
Glencairn Main Reef	—	1 3*	—	1 3*	1 3*	1 3*
Glencoe Collieries	5 9*	—	5 9*	5 9*	—	—
Government Areas	17 3*	17 3*	17 0	17 3	17 3*	17 3*
Jupiters	3 6*	4 0*	4 0*	4 0*	4 0*	4 6†
Kaalfontein Diamonds	0 3*	0 3*	0 3*	0 3*	0 3*	0 3*
Klerksdorp Proprietary	2 3†	2 0†	2 3†	1 9*	1 9*	1 9*
Knight Centrals	5 6*	5 6*	5 6*	5 6*	5 6*	5 7
Knights Deep	23 6*	—	—	25 0†	—	—
Lace Proprietary	3 1†	2 9*	—	—	3 0	3 0*
Langlaagte Estate	17 0*	17 0*	17 0*	—	17 0*	—
Luipaardsvlei Estate	7 6*	7 6*	7 6*	10 0†	—	7 6*
Lydenburg Farms	2 8*	2 8	2 8*	2 8*	2 8*	2 8*
Main Reef Wests	6 0†	5 6*	5 6*	—	—	5 6*
Meyer and Charltons	—	90 0*	90 0*	—	—	90 0*
Middelvlei Estate	—	1 6*	1 7	1 6*	1 6*	1 6*
Modderfontein B.	86 0*	86 6*	88 0†	—	87 0*	87 6*
Modderfontein Deep	60 3	60 3	60 3	60 3	60 0*	60 3*
New Era Consolidated	5 1*	5 1*	5 1*	5 1*	5 0*	5 0*
New Geduld Deeps	1 10*	1 10*	1 10*	1 10	1 10*	1 10*
New Gochs	12 9*	12 9*	12 9*	12 9*	12 9*	12 9*
New Heriots	62 6*	62 6*	62 6*	62 6*	62 6*	62 6*
New Kleinfonteins	19 9	20 0	21 3	21 3	21 3	21 9
New Modderfontein	247 6*	—	247 6*	250 0*	250 0*	257 6†
New Unifieds	18 9*	—	19 3†	19 0†	19 0†	19 0†
Orange Diamonds	0 10*	0 10*	0 10*	0 10*	0 10*	0 10*
Pretoria Cements	44 0*	43 9*	—	—	—	—
Princess Estate	5 0†	—	4 0*	4 0*	5 0†	—
Rand Mines	—	—	—	—	88 0†	—
Rand Klips	2 7*	2 7	2 7*	2 7*	2 7*	2 8*
Rand Nucleus	1 6*	1 6*	1 6*	1 8	1 8†	1 6*
Randfontein Deeps	2 9*	2 9*	2 9*	2 11*	2 11*	2 10*
Randfontein Estates	15 0*	15 9†	15 9†	—	15 3*	15 3*
Robinson Deeps	—	—	—	—	—	22 6*
Rooiberg Minerals	—	20 6	20 9*	20 0*	20 6*	20 3*
Roodepoort Uniteds	—	6 0†	—	6 0†	6 0†	—
Ryan Nigel	2 0*	—	—	—	—	—
Shebas	2 6*	2 6	2 6*	2 9*	2 9*	2 9*
Simmer Deeps	1 9†	1 9†	—	—	—	—
S.A. Lands	2 4*	2 4*	2 4*	2 6†	2 4*	2 6†
Springs Mines	15 3*	15 6	15 3*	16 0*	16 0*	16 0*
Sub Nigels	10 0*	10 3b	10 9*	10 6*	10 3*	10 0*
Swaziland Tins	22 6*	22 6*	22 6*	23 0*	23 0*	—
Transvaal and Delagoa	—	44 3*	—	—	—	—
Transvaal Coal Trust	32 0†	32 0†	32 0†	31 6†	30 0*	30 0*
Transvaal Lands	—	—	11 0*	—	11 6*	11 6*
Transvaal G.M. Estates	36 0†	36 0†	35 6†	—	35 6†	34 6*
Van Ryn Deeps	44 9	—	44 6	44 3*	44 9	44 6*
Village Deeps	33 3*	34 0*	34 0*	34 3*	34 0*	34 3*
West Rand Consolidated	5 0*	5 0*	5 6*	—	—	—
Witwatersrands	58 0*	57 6*	58 6	58 0*	58 6*	58 6*
Witwatersrand Deep	35 6†	—	35 6†	34 0*	35 0	34 0*
Wolhuters	13 0	13 0*	13 1*	13 1*	13 3*	13 4*
Zaaiplaats Tins	—	26 0	26 6	26 3	26 6	26 0

*Buyers. †Sellers.

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MECH. ENGINEERS - June (Kimberley Centre) - - ALL ,,
MINE OVERSEERS - - - - - - Practically ALL ,,
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MINING MEN AND MATTERS.

Mr. H. C. Boyd left this week for London.

* * * *

Mr. C. Davis is paying a visit to England by this mail boat.

* * * *

Mr. W. Spencer, of Messrs. Spencer & Sons., Ltd., of Sheffield, is paying a visit to the Rand.

* * * *

Mr. Owen Letcher, who has been paying a brief visit to the Rand after six months with the 1st I.L.H., left this week for G.W.S.A. to rejoin his regiment.

* * * *

Among the officers appointed to the new mounted R.E. troops being organised by Major Hawkesley, R.E., are Messrs. R. G. Campbell Pitt and W. Pack, the resident engineer to the Premier Mine.

* * * *

Mr. W. J. Griffin, at one time manager of the Johannesburg branch of the A.E.G., has returned to the Rand, and contemplates starting business on his own, having secured some first class agencies.

* * * *

Lists of certificates issued by the Mines Department for the period ended 20th February, 1915: Mine Managers' Certificates—Metalliferous: G. S. Butlin, E. P. Cowles, G. O. Paterson, W. E. Turvey, W. C. Coe, A. S. Lejeune, J. Smart. Coal: N. Rogers, G. McConnell. Mine Overseers' Certificates—Metalliferous: J. G. W. Couperthwaite, S. Creed, G. A. Voskule, G. S. Watson. Coal: J. Nisbet, H. V. Orwin, L. H. Thomas.

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THE WEEK IN THE ENGINEERING AND MINING MATERIAL TRADE.

Local Stocks Begin to Feel the Effects of the War—German Goods—An Explanation—Increased Demand for Iron and Steel.

Mining Material.

Stocks are beginning to feel the effects of the war in Europe, as a few lines are scarce, but so far nothing of any real importance to the mining industry. Complaints are made that German goods still enter into keen competition in Johannesburg, but this is explained by the fact that immense quantities were on hand here, as well as in England, when war broke out, and these have not yet been absorbed as a whole, but only in parts. To give an example, there was a shortage of miners' lamps, and when they were recently imported direct from England it was found that the whole consignment of some 2,000 were of German make; the inference is that they were bought and paid for before August last. At the moment no one believes that we are getting goods from Germany; therefore the only explanation is the one ventured upon, viz., heavy stocks purchased before the war. We are not receiving consignments so regularly from England as formerly, as some indents sent in August have not yet materialised, chiefly because some of the great hardware and machinery factories have practically been taken over by the Government through military exigencies. Carbide is scarce, as a mining group has purchased very freely, when they discovered that mining contracting firms would not guarantee prompt deliveries owing to the new shipping risks. The idea was to tender a price subject to delays on account of the unusual sea risks now prevailing, but the group in question would not agree, as they maintained that after a large order was given out it would prevent many firms importing freely, and when a contract was made, they contended, the goods were wanted accordingly. The price of carbide to-day is 24s. to 25s. per 100 lbs., as compared with 21s. 6d. before the war. However, there are consignments on the water, coming direct to South Africa from Norway, which should ease the position.

Iron and Steel.

There has been an extra good demand for heavy railway rails owing to the washaways and the new light military railway constructions. Imported bar iron is plentiful, the standard price being 15s. 6d. per 100 lbs., but there is rather a large parcel of oversea iron in the market at 11s. 6d., 4in. by ⅝in. The locally made iron is the factor keeping prices down, as it runs about 2s. 6d. cheaper than the ordinary imported article. Steel plates are in fair demand at from 14s. 6d. to 16s. 6d. 100 lbs. All kinds of galvanised iron and wire are dearer with a tendency to advance, as the spelter, which enters largely into their manufacture, chiefly came from Germany, and now that that supply has been consumed, with a stoppage of further supplies, another source has been requisitioned, and that is in America, which is much dearer.

Timber.

The tendency is for higher rates, owing to the increase in shipping freight as well as extra insurance on ships coming from the Baltic, on account of the reckless strewing of mines in the North Sea. In a measure the extra freight from America has made an increase in certain classes of timber. Local rates are: Deals, 7d. to 7½d., according to length; flooring, ⅞in., 3½d., medium; ceiling, ½in., 2⅜d.; pitch pine, 4s. 10½d tc 5s. 3d. per cubic foot; Oregon pine, 3s. 6d. per cubic foot. Mining poles, especially hardwood, are in good demand at the late firm values.

Leather Belting.

All values for leather are high, with every chance of advancing. English backs 4s. 6d., sole bends 4s., Australian harness sides 2s. 9d. and backs 3s. 3d., Colonial sole bends 2s. 9d.; all of which are local rates. According to a local list, leather single belting prices are: 1in., 3½d.; 2in., 7d.; 3in., 1s.; 4in., 1s. 5d.; 5in., 2s.; and 10in., 4s. 3d. Double belting: 3in., 2s.; 6in., 4s. 3d.; 10in., 7s. 8d.

Miscellaneous.

Permanganate of potash is practically unobtainable in town. The big stocks of mining stores, machinery spares, chemicals and such like, secured by the mines in August last are beginning to be depleted; therefore, it often happens that unexpected orders for quantities are forthcoming. Pumps have been in good demand of late, as well as spares and fittings, on account of the flooded state of some of the mines.

Petrol, Turps, and Paraffin.

Stocks continue good. Petrol, 22s.; yellow label, 23s. 3d.; benzine, 18s. 6d.; turpentine, 40s.; texine, 23s.; and paraffin, 12s. per case.

Coal.

So far the mines have been kept well supplied, although now and again fears have been entertained as to the supply of trucks, on account of the washaways and the pressure of military requirements.

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A Sheffield correspondent writes:—" Although there is a trouble in getting consignments to the coast, there appears to be a continually expanding movement in oversea contracts.

The Steel Trade.

It is, of course, impossible to know all that is taking place in that direction, but the volume of it may be judged from the fact that large tonnages of special steel have been booked for Beira, Nagasaki, Hong Kong, Milan, Bahia, Yokohama, Kobe, Natal, Bangkok, Lisbon, Johannesburg, New York and other places in the States, and Montreal; saws for Calcutta, Callao, Capetown, Brisbane, Rangoon, and Natal; shoes and dies for Durban; cutlery for Toronto, Brisbane, Karachi, and Montreal; gouges and plane irons for Rio de Janeiro; springs for Bombay; files for Hong Kong, Karachi, Bangkok, and Calcutta; chisels and plane irons for Karachi, Bangkok and Bombay; tools for Rio de Janeiro, Perth, Adelaide, Capetown, Lourenco Marques, Bombay, Brisbane, Victoria, B.C., and Auckland; sheep shears for Capetown; hammers for Sekondi; drills for Port Swettenham and Bombay; augers for Bangkok; and pickheads for Delagoa Bay. A good deal of satisfaction has been expressed here at the fact that of the four battle cruisers which defeated the German squadron in the North Sea on Sunday, two were built by John Brown and Co.—the Tiger and the New Zealand—and one by Vickers, Limited—the Princess Royal—most of the material for all three vessels having been made in Sheffield. Another point of considerable interest here is the announcement that Vickers, Limited, are to take over the Diesel works at Ipswich and to commence operations there as soon as possible. Vickers have also, I learn, nearly completed the new plant being installed at their Crayford works for the manufacture of sewing machines in order to capture some of the German markets in that direction."

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WORKS:
VENTERSBURG ROAD, O.F.S.

Bigger Profits for Mines in 1914.

On the Rand for 1914 no fewer than 22 companies were able to show improvement in profits over the 1913 record, as the following table demonstrates: -

Mine.	Working Profit.		Increase
	1914.	1913.	
City and Suburban	£248,500	£246,500	£2,000
City Deep	406,700	292,900	113,800
Con. Langlaagte	318,400	252,200	66,200
Con. Main Reef	130,600	124,700	5,900
Durban Gold	37,800	36,700	1,100
Geduld Proprietary	103,000	36,200	66,800
Clencairn	33,500	31,800	1,700
Glynn's Lydenburg	49,000	46,200	2,800
Knight Central	42,700	32,200	10,500
Langlaagte Estate	186,100	160,600	25,500
Luipaard's Vlei	32,100	30,900	1,200
Meyer and Charlton... ...	256,500	253,700	2,800
New Goch	122,200	64,100	58,100
New Heriot...	120,500	82,200	38,300
New Modderfontein	643,400	528,600	114,800
New Unified	62,200	59,800	2,400
Princess Estate	24,300	21,800	2,500
Roodepoort United	14,900	13,600	1,300
Sub-Nigel	25,200	24,900	300
Van Ryn Deep	414,000	108,200	305,800
Village Deep	308,500	242,000	66,500
Witwatersrand (Knights)	296,300	270,200	26,100

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To Promote British Trade. His Majesty's Trade Commissioner in South Africa is authorised to state that a British Trade Fair, under the control of H.M. Board of Trade, will be held from May 10th to May 23rd inclusive at the Agricultural Hall, London, on lines similar to the Trade Fair held some time ago at Leipsig. Manufacturers will exhibit samples of British-made goods, and such exhibition will be limited to toys, fancy goods, earthenware goods, glassware, cutlery, electro-plate, clocks, common jewellery, paper, and stationery. South African importers interested in these lines are invited freely to communicate their requirements direct to H.M. Board of Trade, British Industries Fair, 32, Cheapside, London, E.C. Everything possible will be done to place enquirers into touch with British manufacturers in a position to satisfy such requirements.

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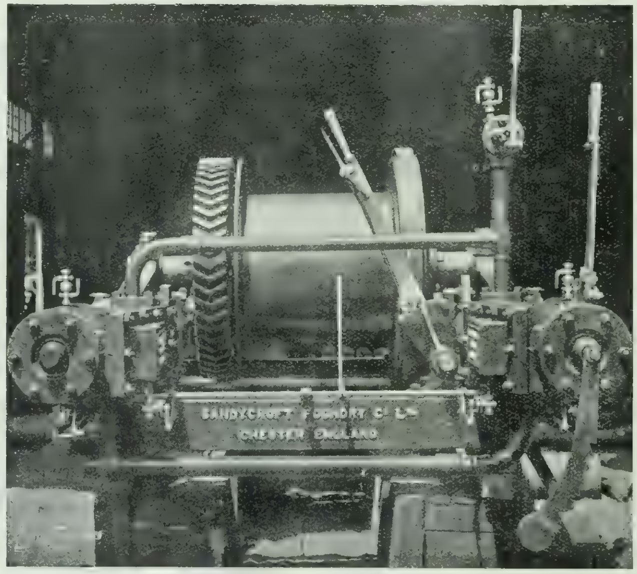

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SPECIAL ELECTRICAL SUPPLEMENT.

(ILLUSTRATED.)

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PROGRESS OF THE SOUTH AFRICAN INSTITUTE OF ELECTRICAL ENGINEERS.

Some Notable Addresses Demand a Supplement to Themselves—A Word about the Papers and their Authors—Mr. W. Elsdon-Dew's Wide Forecast and Review—Mr. Bernard Price's Straight Talk on the Education of Young Electrical Engineers in South Africa—Growth of Centralised Power Supply on the Rand—The Only Comprehensive Account ever Attempted—Some Important Coming Papers.

The remarkable progress of electricity on the Rand and of the South African Institute of Electrical Engineers is at once the cause of, and the justification for, this supplement. So close has been the connection, and so parallel the expansion of the Institute, with the growth in the application of electricity to Rand mining that no attempt to appraise the latter can fail to include the former. Moreover, for a variety of reasons it is fitting that the end of the first lustrum of the activities of the Institute and the passing of the fifth milestone on its triumphal path should be made the occasion for this stocktaking of the position, this gathering together, for the benefit of our readers, of the best that has lately been thought and written by the leading spirits of the Institute. Not that the Institute or its office bearers have sought or desired publicity—not to say special treatment of this sort. Beyond the usual courtesies extended to us by all the scientific societies which we here gratefully acknowledge—our attentions have been wholly unsought. Because of its very youth, however, and the magnitude of the interests with which it has come to be identified, we have followed the activities of the Institute of Electrical Engineers with especial regard, and it seemed a pity to bury away amid multitudinous pages devoted to the more familiar process of mining, the thought-compelling addresses segregated and printed, with appropriate illustrations, in the succeeding pages.

The Authors and Their Papers.

Pride of place must be given to Mr. Bernard Price's Presidential address, delivered last week at a crowded meeting of the S.A. Institute of Electrical Engineers. The address divides itself naturally into two parts—that concerned with the education of the young electrical engineer in this country and that dealing with the Rand power supply—and we have taken the liberty of emphasising that division by giving separate headings to the two sections. Without professing special knowledge of the controversial points raised by Mr. Price in the first part of his paper, it may be said that his views have the adhesion of the highest and most disinterested authorities in our midst. The second portion of the paper is frankly informative and instructional, and the elaborate analysis it includes of "fundamental and general diversity" alone invests the whole with unusual value. The diagrams accompanying the paper represent the results of an infinite amount of study and labour in a little room. More discursive and broadly reflective of the whole field of electrical development, Mr. Elsdon-Dew's paper conveys just that quantity and amount of information that the average reader can profit by and assimilate. Indeed, no better account of the present position of electrical engineering in this country is available to those who desire, at the expenditure of a minimum of time and trouble, to get abreast of current developments in this direction. And, lastly, we have included an authoritative account by Mr. A. E. Hadley (the only one of its kind) of the central power supply system of the Victoria Falls and Rand Mines Power Supply Companies. With the kind assistance of the companies concerned we have been enabled to make the few changes rendered necessary in the paper by the recent additions to, and extensions of, the plant. As it stands, we believe the paper gives the best and only authoritative description of this mammoth power supply system that has yet appeared.

The Illustrations.

The illustrations will be found not the least interesting feature of the following pages. The photographs of the new President, the ex-President, and the indefatigable Secretary of the Institute, are [illegible] executed by [illegible]

[illegible]—or, to vary the metaphor, should [illegible] of successful public institutions. Among the views of works and machinery, that of the interior of the Rosherville Power Station, is quite the most [illegible]. It was specially taken for the Chairman of the Victoria Falls Company, the Marquis of Winchester, and we are enabled to reproduce it by the courtesy of that company. The other views may be regarded as typical of the electrical equipment and plant on these fields, several of them being plainly the " last word " in modern electrical machinery.

The Future.

The future of electricity in South Africa is bright indeed. That is, perhaps, the first and most obvious conclusion one draws from the perusal of the accompanying pages. In electric power supply for mining, municipal, and railway service, in electro-chemistry, and in the manifold other applications of electricity to all departments of human activity, the future is full of promise. In keeping pace with those developments the S.A. Institute of Electrical Engineers will doubtless, as in the past, continue successfully to prove itself the hand-maiden and coadjutor of scientific progress. At an early date Prof. Dobson and Mr. Bernard Price promise further to enrich the transactions of the Institute with papers on Johannesburg municipal electric plant and central power supply respectively. Our readers need not fear that these important papers will be hidden from, or lost to, them in the depths of the official transactions. As the Institute is to the electrical engineering profession on these fields—patiently gathering and putting results on record—so we hope to be to the Institute. And if our efforts continue to be rewarded with papers of such value and importance as those presented in this issue, assuredly they shall not have been put forth in vain.

THE EDUCATION OF ELECTRICAL ENGINEERS IN SOUTH AFRICA*

Mr. Bernard Price's Presidential Address—Some Valuable Advice and Plain Speaking. —Future of the South African Institute of Electrical Engineers—Development of South African Resources.

In accepting office as your President for the year 1915, I am sensible of the honour and of the responsibility conferred upon me—an honour of which I feel very proud and a responsibility which I realise becomes increasingly onerous as the scope of the Institute's activity extends. I heartily welcome the opportunity afforded by my election of devoting myself still more closely to the affairs of the Institute, and I desire to assure members that I shall do my very best to further the interests both of the Institute and of the profession during my term of office. It will be my endeavour to emulate the achievements of past Presidents, and at the expiration of my term to leave the Institute in an even stronger position than that in which it stands to-day. In this address, I do not propose to enter into the technical problems of that branch of engineering with which I have been most closely associated. I hope, on a future occasion, to present a paper in which I shall be able to deal in detail with such a large subject as "The Electrical Systems of the Power Companies on the Witwatersrand." On the present occasion, I propose first to touch upon certain matters which concern the Institute's affairs, and then to submit a few notes regarding some of the more general aspects of electrical power supply to the mining industry in this district. Upon the completion of the first five years of its career, there is, I think, every reason to feel gratified with the progress that the Institute has made, and I am sure that our first President, Mr. Campbell, and those who shared with him the task of founding the Institute may well feel proud of the success which has been achieved as the result of their efforts and the efforts of their successors in office. From unpretentious beginnings the Institute has placed itself in a sound financial position, and it is the hope and aspiration of your Council that the Institute should play an increasingly important part in the engineering development of this country and in furthering the interests of the profession.

STATUS OF THE ELECTRICAL ENGINEER.

Six years ago little heavy electrical engineering work had been done in this country, and the status of the electrical engineer in South Africa was not commensurate with the importance of the work that was then being undertaken. To-day we can say that electrical engineering in South Africa has attained to an important place in the engineering world, and that the status of the electrical engineer has been brought much more nearly into correct perspective. Whilst I believe that the work and influence of the Institute has contributed towards this result, I have always felt that time alone was necessary to prove the value of electrical engineering on these fields, and to bring due recognition to electrical engineers engaged thereon. Although a representative body such as this Institute undoubtedly adds weight to the profession in a collective sense it is upon the intrinsic merits of work done and benefits conferred that our status must ultimately depend. It should, therefore, be our constant aim to advance in knowledge and in skill and to assist forward the younger generation of electrical engineers who will some day take our places in the profession.

TRAINING OF ELECTRICAL ENGINEERS.

The education and training of electrical engineers in this country is a subject which must always be of concern to this Institute and to many of us personally who have young men under our charge, and it is, I think, a matter which presents some difficulty. In the first place it would seem that very few men are prepared to set aside a sufficient period of their early career to acquire the theoretical and practical training which is essential to future success, and secondly there are no manufacturing concerns in this country where up-to-date experience can be gained in the practical work of electrical engineering. I hold strongly to the opinion that the training of electrical engineers should be based upon an all-round mechanical experience, and there are opportunities in this country for obtaining experience in good mechanical shops, but the field for electrical work is confined to repair shops and the departments of a few electrical supply undertakings.

ADVICE FOR THE YOUNG ENGINEER.

If I were asked, as I sometimes am, to advise a budding engineer as to the course he should pursue, I would recommend that in those cases where funds will permit he should commence by taking the full course at one of the excellent technical colleges in this country and that he should then serve his time in up-to-date manufacturing works in Europe. Whether funds will or will not allow of this period of practical training in Europe, the student should realise that a thorough practical training is essential and that he is really only ready to start at the very bottom of the ladder when he leaves College. He should appreciate that during these early years it is of vastly greater importance to acquire the right kind of experience than it is to make money, and he should choose his work accordingly. If, upon leaving school, the boy is not in a position to afford the full day course at a College, he should indenture himself as an apprentice and take evening classes. This procedure, though not so thorough, saves time, and there is no reason why the apprentice, if he studies hard and has the necessary ability, should not become as good a man as his more fortunate contemporary at college.

DANGER OF SHORT CUTS.

I do not think I am off the mark when I say that the majority of the young men of this country who decide to enter the profession of electrical engineering are tempted to take what they imagine to be a short cut to success by curtailing their theoretical training and by accepting remunerative employment before their practical experience has been acquired. Of the men who enter for the course at the College here in Johannesburg, only a very few have ever completed the full term. Most of the students have drifted away after twelve or eighteen months to earn money on the mines. Even those who have completed their course have seldom stuck to electrical work, but have been entranced by the prospect of £20 or more per month for work which, although it may in some small degree require the application of scientific methods acquired at College, is useless from the stand-point of the career of an electrical engineer. In my opinion it is this idea that a technically trained man of twenty years of age, when he leaves college, should straightway earn a man's wage that is the root of the evil. Those of us who had to work our way up from the bottom against the keen competition which exists at Home cannot but be impressed by the contrast between our early experiences and those of the young man here. After three years at College, followed by a strenuous time as an apprentice in large marine engineering shops, I started at 30s. per week in a manufacturing electrical engineering firm, and it was ten years after I entered College before I began to reap the reward of a thorough training by drawing the princely salary of £150 per annum. I can only say that if I had my time over again I would repeat the programme in almost every respect, but I would make better use of those early years of training, for I am convinced that one cannot over-estimate their value.

FACILITIES OFFERED BY RAND POWER COMPANIES.

The Power Companies in this district offer facilities for the training of a certain number of apprentices and learners in the hope that as time goes on the vacancies which may arise in the Departmental Staffs may be satisfactorily filled from these junior grades. The only qualification required of a learner is that he shall have had a satisfactory technical training, and it is intended that he should gain his practical experience with the company. He enters the department which is responsible for the operation and maintenance of the

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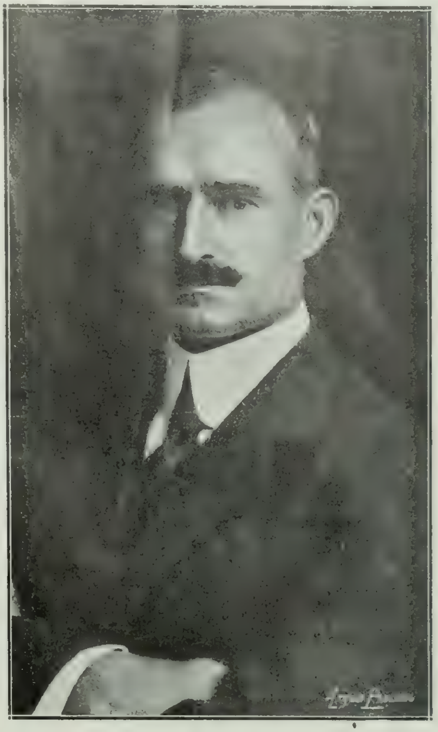
* Read before the S.A.I. of E.E.

MR. BERNARD PRICE,
President, South African Institute of Electrical Engineers.



MR. W. J. CLARKSON,
Secretary, South African Institute of Electrical Engineers.

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whole of the system outside the generating stations, and whilst in that department the learner receives £10 per month, without any increase. The work of this department adapts itself to the employment of a certain number of such raw men but does not provide scope for increasing the usefulness of the learner in a way which would justify an increased rate of pay. From amongst the considerable number of learners in this department selection is made from time to time according to merit to fill such vacancies as may occur for learners in other departments where the work performed may justify a gradual increase in pay. A salary rising from £10 to £20 per month over four or five years, is, in my opinion, all that a learner should expect during these years of training, after which he should be eligible for promotion to some junior position on the departmental staffs, and I do not think it can be said that a young man under such conditions is not quite as well off financially as those who are obtaining their experience at home.

DANGERS OF SOUTH AFRICAN ENVIRONMENT.

In offering these remarks I do not wish it to be inferred that I deprecate the qualities of the South African youth. It is the environment, not the raw material, that is the source of the trouble. When one realises that on the Rand a bachelor mechanic of say only 22 or 23 years of age can earn £30 per month, of which only half or even less is sufficient to cover all the ordinary expenses of living, and that he has, therefore, £15 per month at least to save or to spend upon luxuries and extravagances, it is not surprising that the technically trained college student is apt to lose his perspective and to assume that money is sure to come easily and that further preparation for his future career may be left to look after itself. The whole atmosphere here is one of extravagance both as regards the use of money and the value of labour and, in my opinion, such an environment militates against the future success of many of our younger engineers. Whilst it is not within our power to alter this environment to any appreciable extent we should, I think, encourage the young men who are serving under our supervision to take a serious view of their career, and this Institute could perhaps do something more than is at present being done in the direction of advising and assisting youthful engineers on matters pertaining to their advancement.

FUTURE OF THE S.A. INSTITUTE OF ELECTRICAL ENGINEERS.

I would now like to indicate certain directions in which I think the Institute might profitably extend its activities. The objects for which the Institute was founded are two-fold: (1) The general advancement of the science and practice of electrical engineering; (2) the promotion of social intercourse between members. Our proceedings have included many valuable papers, and the discussions on these papers and on the series of questions which have more recently appeared upon the agenda have been most useful. I think, nevertheless, that we could with advantage broaden the scope of our meetings by providing opportunities for assimilating and disseminating all information, experience and data which members may be in a position to furnish. I hope, therefore, that the Council will consider some means whereby members may, from time to time, be given an opportunity of submitting any matter of interest, such as a short explanation of some particular experience, accompanied perhaps by a sketch, photograph or sample illustrative of the occurrence described, or a short description of what our American Friends would call a "stunt" concerning some particular job. I think we should also try to amplify our question list. It is natural that the Council, when left to compile questions, should endeavour to select those which may lead to a keen debate, but I see no reason why the general membership of the institute should not send in a large number of interesting, though perhaps less comprehensive, questions, many of which arise in the course of one's daily work. What we should strive for is to make every member of the Institute, of whatever status, sufficiently interested in our proceedings to take some share, however small, in the active work of the Institute.

DEVELOPMENT OF RESOURCES COMMITTEE

At this stage I may refer to the prospective work of the Development of Resources Committee. Our object is to help forward in every way we can the electrical development of the natural resources of this country. This step was initiated by Mr. S. E. T. Ewing in a letter which he addressed to Council during last session, and in which he emphasised the fact that it is our duty, as electrical engineers, to stimulate and assist electrical enterprise for the benefit of the country and of the profession. As you are aware the Union Government has kindly promised to grant every facility to the Institute in connection with this work, but the Committee felt that it would be impossible to do justice to such an important matter unless paid assistance could be obtained. During his recent visit to this country the Marquess of Winchester took a keen interest in this matter, and it gives me great pleasure to announce that, largely as the result of his kind offices, the Power Company and one other local body have generously promised to render financial assistance. The Committee will now, therefore, be able to commence its investigations and will ascertain as rapidly as possible the results which are likely to be achieved. If and when it is shown that practical results can be confidently anticipated, I have no doubt that further funds will be forthcoming. I take this opportunity of tendering the sincere thanks of the Institute to these bodies which have so generously promised to assist us in this matter.

THE SOCIAL ASPECT.

Turning now to the social aspects of our affairs, my own view is that here again we should, as soon as conditions permit, endeavour to broaden our basis. We have been fortunate in arranging quite a number of interesting and instructive visits in the past, but with the exception of these, the annual dinner and the few minutes' conversation which is possible over coffee at the termination of our general meetings, our proceedings have not offered opportunities for that informal discussion between members which is such a useful and enjoyable attribute of the functions of a technical society. It might perhaps be worth while considering whether every now and then an informal and inexpensive dinner might not be held on the evening of the monthly general meeting so that members intending to be present at the meeting could meet socially beforehand. It might even be considered whether the general meeting could not occasionally be held at some centre along the Reef other than Johannesburg. In any event as the Institute cannot at present afford a home of its own, I think we should endeavour to provide other means for encouraging social intercourse between members when they come into Johannesburg to attend our meetings.

Rosherville Power Station Interior.

POWER SUPPLY TO THE MINES OF THE RAND.

Notes on the General Aspect of Power Supply to the Mining Industry.

[By Bernard Price.

Having touched upon these few points concerning the Institute's affairs, it may perhaps be of interest if I now submit a few notes on some general aspects of electric power supply to the mining industry in this district, and in doing so I shall confine myself to a description of the main features of the power companies' business, drawing a comparison between its salient characteristics and those of other typical schemes. As you are aware, the business is controlled by two Companies, the Victoria Falls and Transvaal Power Company, Ltd., and the Rand Mines Power Supply Company, Ltd., the latter company being a subsidiary of the former, and the combined system being operated and managed by the Victoria Falls and Transvaal Power Company, Ltd. For present purposes, therefore, the business may be treated as one complete scheme, and as such it ranks as one of the largest in the world.

GENERAL DESCRIPTION OF SYSTEM.

The following general description of the system is necessary for a proper appreciation of the statistics which follow. Typically the scheme is one which supplies a single industry, comprising a relatively small number of relatively large consumers scattered over a compact area. The area takes the form of a narrow strip about 45 miles long, stretching from east to west. There are three generating stations along this strip, namely, Brakpan, at the far eastern end, Rosherville at about the centre, and Simmerpan between the two. There is also an outlying station on the Vaal River at Vereeniging, situated about 35 miles due south of Johannesburg, which feeds into the area at Robinson Central, a point about five and a half miles west of Rosherville. It will be seen, therefore, that there are four points of supply along the narrow area, and as the density of the load is greatest in the neighbourhood of these four points, the average distance of distribution is small compared with that which would be necessary in many schemes.

DISTRIBUTION.

Distribution is carried out at 20,000 volts overhead or underground over all sections of the area, excepting that in the neighbourhood of Simmerpan and a small portion of that fed from Brakpan, where the pressure is 10,000 volts. The choice of these relatively high pressures has been determined by considerations of economy in capital cost of lines, cables and switchgear, rather than of pressure drop. The main transmission system virtually consists of overhead inter-connectors at 40,000 volts between the four points of bulk supply and of two similar lines running west from Robinson Central to feed the relatively small section of the load at the extreme western end of the area. The power generated at Vereeniging is transmitted to Robinson Central at 80,000 volts. The railage charges on coal from the Middelburg colliery district (which lies some 70 miles to the north-east of the area of supply) are heavy, and the supply of cooling water within the area is restricted. It has, therefore, proved advantageous to expend capital upon transmission lines from an outlying station situated favourably as regards water supply and in close proximity to a colliery, and to transmit energy therefrom in the form of electricity rather than in the form of fuel. Under these conditions the stations at Vereeniging and Brakpan, which are nearest to the source from which their fuel is drawn, are operated at the highest possible load factor, and Simmerpan and Rosherville are left to take the remainder of the load at a lower load factor. The following table gives particulars of the demand and consumption of the three classes of consumers served by the companies.

PARTICULARS OF CONSUMERS CONNECTED TO THE POWER COMPANIES' SYSTEM.

Class of Consumer.	No. of Consumers.	Aggregate of Non-simultaneous Maximum Demands at Points of Delivery, January, 1915.		Units Consumed per Annum.	
		K.W.	Percentage of Total.	Millions of Units	Percentage of Total.
Mining	65	95,000	98.0	514.5	99.0
Industrial	8	1,100	1.1	2.8	0.55
Bulk supplies to Municipalities ..	5	900	0.9	2.3	0.45
Totals	78	97,000	100.	519.6	100.

It will be noted as an outstanding feature that no less than 99 per cent. of the business is represented by supply to the Mining Industry.

Figures (1) and (2) give a general idea of the type of supply taken by such mining consumers as have completely electrified their mine. Figure (1) is for a mine working single shift and figure (2) for one working double shift. The compressor load for this latter mine is probably somewhat higher than that for an average case, but otherwise the charts may be considered typical. I shall return to these diagrams later, but in the meantime it may be noted that the load in both cases is at its highest between the hours of 8 a.m. and 4 p.m. in the day time. Figure (3) shows certain load curves of the power companies' system, including only the electric business proper. As you are aware, the Rand Mines Power Supply Company, Limited, also supplies upwards of two million tons of compressed air per annum at a gauge pressure of about one hundred pounds per square inch, and a portion of this air is compressed by means of electrically driven compressors at Robinson Central. As I am now dealing solely with the electric power actually sold as such, the power used for driving the power companies' compressors has been excluded. The curves shown on the left-hand side of Figure (3) have been plotted from half-hourly readings of the units sent out from generating stations on Friday, January 5th, 1915, and Sunday, January 7th, 1915, whilst the week-day curves shown on the right represent the average of six normal week-days during January, 1915, and January, 1912, the Sunday curve

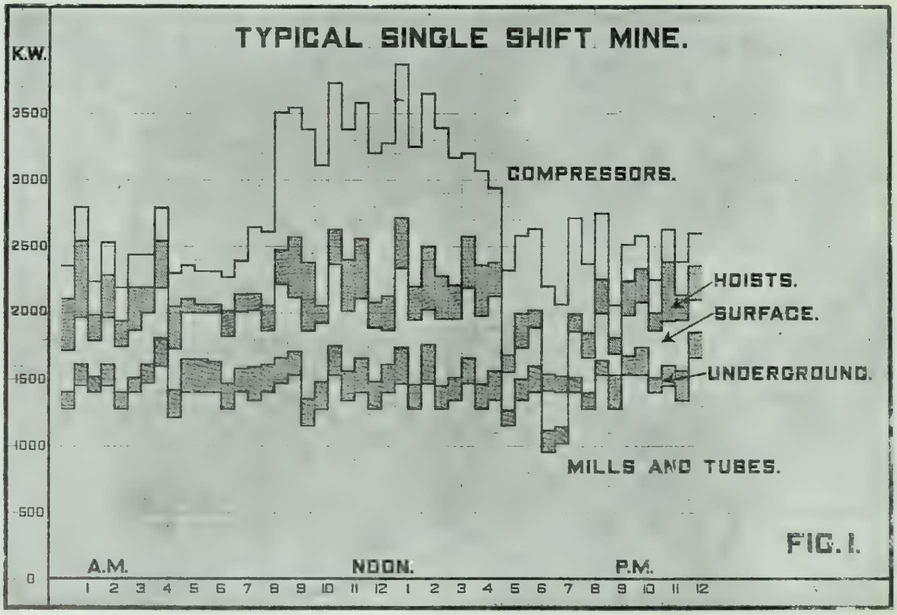


FIG. I.

being an average of four Sundays in January, 1915. All three curves on the right have been obtained from hourly readings, and the curves on the left have been included merely to show the half-hourly fluctuations which occur on a normal day. A similarity between the shape of the load curves of typical consumers and of the power companies' system will be at once apparent, this similarity being due to the fact that the cycle of operations is virtually the same on all mines. Whilst no doubt a certain number of consumers work double shift this does not influence the fact that the periods of maximum demand for all consumers overlap. The shape of these curves is of first importance because upon it depends to a very large extent the cost of furnishing the supply, and it may therefore be of interest to carry the analysis somewhat further.

ANALYSIS OF COST.

It will hardly be necessary for me to explain that the cost of producing and furnishing a supply of electric power is mainly dependent upon two factors, namely: (a) Capital and other fixed charges, which are dependent upon the capacity of the plant and system required for meeting the maximum rate of supply; (b) running charges. The first of these two charges varies inversely as the load factor, whilst the second item, though also dependent upon the load factor, to a very considerable extent, is not directly inversely proportional to the load factor. The load factor of the combination of a number of individual supplies may be influenced by both the load factor and the diversity factor of the individual supplies, and the inter-relationship between these two factors is not always easy to follow. The complexity of the subject is, however, reduced when dealing with a very large system such as that under consideration, because the effect of all short time fluctuations may then be ignored. Standard plant of the type and size now in use, when fully loaded by the hourly average rate of supply, is capable of meeting the short time peaks without undue strain. Large generators and transformers absorb a considerable quantity of heat for a relatively small increase in temperature, and consequently respond but sluggishly in temperature to the fluctuations of heat generated within them. Similarly the boiler plant has a considerable storage capacity for energy, and one of the special characteristics of the steam turbine is its ability to meet heavy overloads without distress. It may in fact be said that as the size of a system increases the percentage short time variation in load tends to decrease, whilst the ability of the plant to deal with such variations increases owing to the increase in the size of unit of plant which can be used or employed. Although some of the winders in this district are unusually large, the largest of them represents a momentary peak of only about 3½ per cent. of the system peak, and at times when two such winders happen to synchronise the variation will be only about 7 per cent., lasting for a couple of minutes at the most. The average rate of supply taken over an hour is therefore a satisfactory guide as to the amount of plant required for meeting the service, and for this reason statistics regarding loading are taken on the basis of units per hour. I will refer to load curves made out on this basis as "Smoothed Load Curves," that is, curves on which the short-time fluctuations have been averaged over an hour. This basis is very convenient in every-day practice, because integrating instruments have to be provided in any event for measuring station output and consumers' consumption, and such instruments are very reliable and accurate. Moreover, it is a simple matter to provide attachments to the sub-station integrating instruments which will record on a dial the maximum of the hourly consumptions, thus rendering it unnecessary to record each of the many hundred hourly figures, and to then select the maximum therefrom. These attachments operate on the same principle as a maximum and minimum thermometer. By means of a clock the mechanism of the integrating watthour meter is brought into gear with the attachment at a given time, and thereafter for one hour the movement of the meter turns the pointer on the dial of the attachment round the scale of units. At the end of an hour the clock resets to zero the mechanism which has been actuating the said pointer, leaving the pointer itself where it is, and this process is repeated during the second hour, and so on. If the number of units consumed during one of the subsequent hours is greater than that during the first hour, the actuating mechanism reaches the pointer before the end of the hour and moves it further round the scale so that it may register the greater consumption. The position of the pointer at any given time, therefore, shows the maximum of the consumptions taken during successive hours since the time when the pointer was last set back to zero by hand. The installation of such apparatus at every point of supply throughout the system enables accurate and complete data to be obtained regarding the load factor and diversity factor of the smoothed curves of the various supplies.

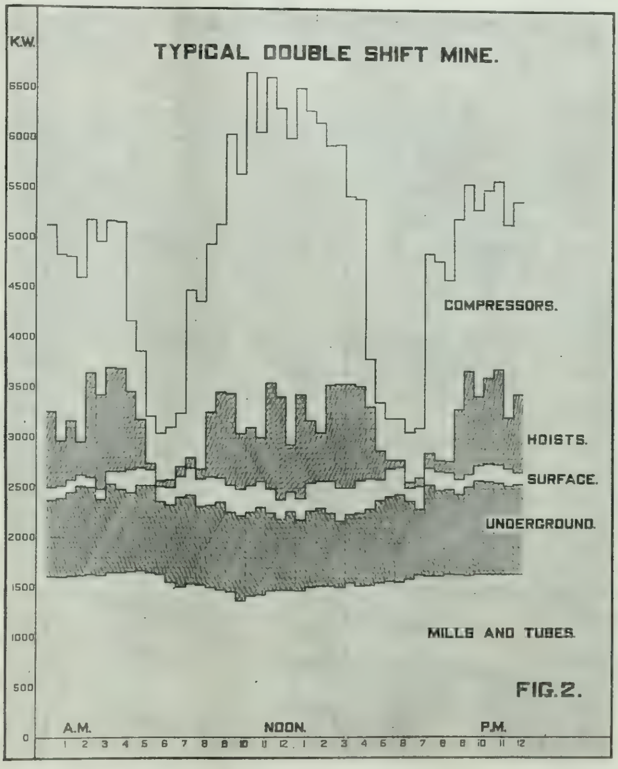


FIG. 2.

TWO TYPES OF DIVERSITY

The diversity between any given selection of supplies may, I think, be considered as being of two independent types. Firstly, there is such diversity as may be due to a fundamental difference in the shape of the smoothed load curves of component supplies, having due regard to time (I will refer to this as "Fundamental Diversity"); and, secondly, there is the diversity which is due to irregularities in that portion of each of the smoothed load curves which falls within the period of the maximum demand on the system (I will refer to this as "General Diversity"). In most large schemes the general shape of the load curves of individual supplies differs more or less for the several classes of consumer served on account of differences in the type of business carried on, and differences in the cycle of operations peculiar thereto. In other words, most schemes [illegible] benefit from fundamental diversity between the demands made by several different classes of consumers, whereas there is virtually no fundamental diversity on the system of the Power Companies in this district at the present date. The diversity here may be attributed entirely to general diversity, that is, to the interleaving of the fluctuations on the smoothed load curves of individual consumers during the period of maximum demand of the resultant supply. Reference to figures (1) and (2) will show, however, that this general diversity will not be inconsiderable as the amplitude of the hourly fluctuations on the smoothed load curves of individual consumers during the period of the peak is by no means small. To my mind, the clearest way to express diversity is to take the ratio between the aggregate of the individual maximum demands (which are non-simultaneous), and the maximum aggregate of simultaneous individual demands taken at the points of delivery in each case. The aggregate of the non-simultaneous maximum demands is arrived at by adding together the readings of the maximum demand attachments of the sub-station watthour meters above described. The maximum aggregate of simultaneous individual demands cannot be conveniently measured at points of delivery which are scattered all over the area, but is arrived at by selecting the maximum number of units sent out from generating stations during the successive hours of the period in question, and then correcting this figure for loss in transmission and distribution. In figure (4) statistics are given regarding the load factor, diversity factor and losses for the Power Companies' system in the form of monthly figures extending over the last four years. It will be observed that the diversity factor (which is calculated as above described) varies between 1.2 and 1.25, which means that twenty to twenty-five per cent. more plant would have been required to meet the supplies if there had not been diversity between the hourly humps and hollows on the shape of the smoothed curves of the individual supplies. This factor, being obtained from smoothed curves only, eliminates the very much greater amount of diversity which must exist between the short-time fluctuations on the charts obtained from curve drawing wattmeters. Such short-time fluctuations of the individual supplies are almost entirely due to the winders and haulages, and there are so many of these that very complete diversity takes place between them. The following table is interesting in this connection: -

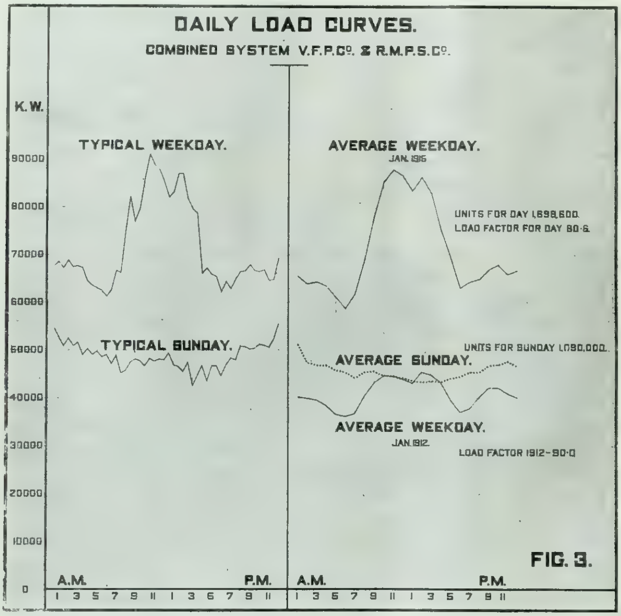


FIG. 3.

PARTICULARS OF WINDERS CONNECTED TO THE POWER COMPANIES' SYSTEM.

Type of Winder.	No. of Winders.	Total Installed Capacity at Continuous Rating. H.P.	Average size at Continuous Rating. H.P,
Underground winding—			
A.C. winding motors ...	62	17,600	284
A.C. geared hoists .	52	22,300	430
Surface winding -			
A.C. direct coupled hoists	10	12,700	1,270
Ward Leonard hoists ...	19	21,400	1,130
Totals . . .	143	74,000	517

Continuous rating of largest Ward Leonard hoist about	5,000 h.p.
Present momentary peak demand for ditto	9,000 h.p.
Continuous rating of largest A.C. hoist	1,600 h.p.

The above figures are specification ratings.

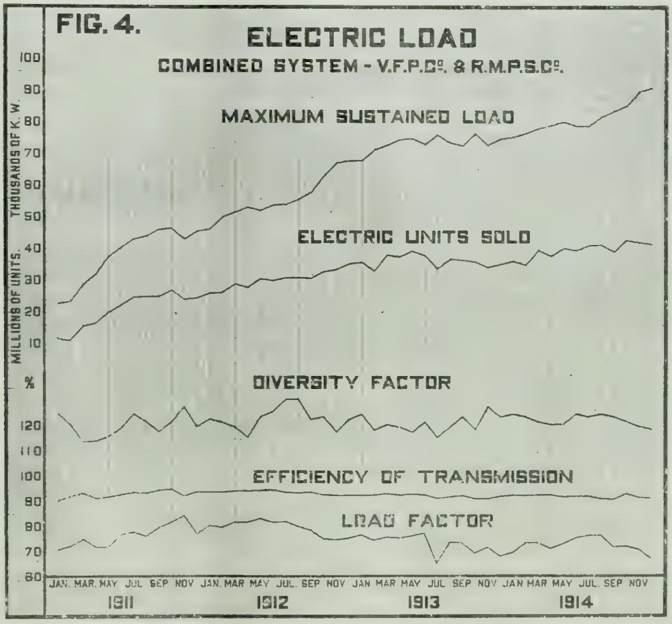
A WORLD RECORD.

It will be noted that the system supplies no less than 143 winders (exclusive of haulages) aggregating 55,000 K.W. at continuous rating. I do not think there is another scheme in the world which is supplying such a large capacity of this class of load. An intermittent supply of this type, involving as it does a very heavy momentary peak, which is often taken at relatively low power factor, is generally considered an unfavourable type of supply from the Power Companies' point of view, but this is only partially true. The reduction in power factor is undoubtedly most objectionable, but whereas a small number of such loads connected to a relatively small system would necessitate an increase in both the kilowatt and K.V.A. capacity of the system plant for the sole purpose of meeting the monetary demand caused by synchronisation of the individual peaks; and whereas such loads would prejudicially affect the voltage and speed regulation of the system, a large number of such supplies connected to a large system diversify very fully and have no prejudicial effect other than the reduction in power factor.

EFFECT OF ADDITIONS.

It may in fact be said that having once connected a few winders to a large system, it is beneficial so far as the diversity and regulation of the system is concerned, to add as many as possible. Under the conditions obtaining on the Power Companies' system to-day, the addition of a new large winder has no more effect upon the load curve of the system than the addition of a load having a smoothed curve similar to that of the winder. In figure (5) an attempt has been made to show how the Power Companies' system load curve is built up. To do this accurately would involve the collection of an enormous amount of data; in fact, it would be necessary to obtain the actual smoothed load curve of each section of each component supply. A sufficiently close approximation can, however, be obtained by assuming certain diversity factors for the several components and by calculating the maximum demand from particulars of the total installed capacity of each class of plant on consumers' premises. Certain assumptions have also been made with regard to the shape of the load curves of individual sections of the supply, but I think the following conclusions may be safely drawn from this diagram:—(1) If it were not for the load taken by compressors and winders the system load curve would be very nearly at and would probably have a week-day load factor of over 90 per cent. As a corollary the miscellaneous load on the surface and underground has a relatively high load factor. (2) There is a pronounced valley in the system load curve between the two shifts on the mines, that is at about 6 a.m. and 6 p.m. The relatively small rise in the load after 6 p.m. and until 6 a.m., as compared with the large rise between 6 a.m. and 6 p.m., shows that a large majority of the mines now work single shift. This point is brought out very clearly when comparison is made between the week-day load curves shown on the right-hand side of figures (3) for 1912 and 1915. In January, 1912, the height of the night peak (taken from the mean of the bottom of the two valleys) is about 65 per cent. of the height of the day peak taken from the same point, whereas in 1915 (that is three years later) the percentage has fallen to about 25 per cent. This increase in the proportion of day peak to night peak is largely due to the fact that many mines have changed from double to single shift working since 1912. I have already pointed out that the load factor of a combination of supplies may depend upon both the load factor and the diversity factor of the components. Figure (5) will serve to exemplify this. Each supply to stamps and tube mills has a week-day load factor of close upon 100 per cent. due entirely to the exceptionally high load factor of each individual mill and tube mill motor. In this instance diversity plays practically no part. The winders and compressors on the other hand have a relatively low load factor, but as their smoothed load curves are similar and overlap the diversity is confined to "General Diversity," and this is therefore a case where some benefit (but not very much) is derived from diversity. The remainder of the load, however, is made up of a multiplicity of miscellaneous loads underground and on the surface, the operation of which in many cases is not governed by any particular schedule. No doubt some of the loads have high load factors individually, but on the other hand a large number have very low load factors and diversify greatly on account of the fact that the consumers' business is in progress night and day rendering it possible for intermittent work to be spread over the twenty-four hours. It must be borne in mind nevertheless that the major portion of this diversity takes place between motors on a given mine, and there will not, therefore, be very much diversity between the smoothed load curves of the miscellaneous supplies of different mines. The week-day load factor of the system for January, 1915, as calculated from the six days average curve in figure (3) is 80.6 per cent., and it will be observed that the monthly load factor as shown in figure (4) now varies between 70 and 75 per cent., depending largely upon the proportion which the number of Sundays bears to the number of week-days in the month. In January, 1912, the week-day load factor calculated from the curve in figure (3) is 90 per cent., and the monthly load factor at that date as shown in figure (4) was about 80 per cent. If the load factor had remained at this figure of 80 per cent. instead of falling to the present average of 72.5 per cent. the plant capacity required on the Power Companies' system would to-day be reduced by about 8,500 K.W., together with a corresponding reduction in the margin of spare plant of 2,100 K.W., making a total reduction of 10,600 K.W. This means that one of the large generating units at Rosherville or Vereeniging could have been dispensed with, and this is roughly a measure of the extent to which the electric business of the Power Companies has already been affected by the adoption of single shift working as a general policy by the industry. The position as regards load factor and diversity factor may, therefore, be summed up by saying that the load factor of the Power Companies' system is high because each and every consumer has a relatively high load factor. As compared with most schemes, diversity plays a very minor part. Figure (5) also shows the variation in the power factor of the total electric load on the system during a typical week-day, including the supply to the electrically driven compressors at Robinson Central. The motors which drive these compressors are of the synchronous type, and are over-excited to take leading current. The power factor shown on the curve does not therefore represent that due solely to the loads demanded by consumers, but it will be observed that under the conditions obtaining, the figures average about 77 per cent. to 78 per cent. during the peak. The third curve in figure (4) shows the variation in efficiency of transmission and distribution during the last four years. The factor is the ratio which the total number of high tension units delivered to sub-stations bears to the total number of units sent out from generating stations during each month. Although the units taken by consumers are measured at the low tension busbars in the sub-stations, 2 per cent. is allowed to the Power Companies in the case of mining consumers to cover transformer losses and the overall efficiency down to the low tension meters in sub-stations is therefore about 2 per cent. less than the figures shown on this curve. It will be observed that the efficiency has fallen slightly during the last two years, and now averages about 92 per cent. (that is about 90 per cent. to low tension busbars). This fall is due to the increasing proportion of the output generated at the distant station at Vereeniging and the fluctuations on the curve are accounted for by changes in the relative loading of several stations and the consequent change in the distribution of load over the transmission system. A loss of only 10 per cent. from generating station busbars to low tensions busbars on consumers' premises is evidence of the fact already mentioned, namely, that in this district distribution is carried out at relatively high pressure over relatively short distances. Figure (4) also shows the growth of the maximum sustained load and of the total output of the system since January 1st, 1911. The maximum sustained load means the maximum number of units sent out from all generating stations during the successive hours of the month, or, in other words, the maximum hourly average load. It will be seen that the business is now three and a half times greater than it was four years ago, and still shows a tendency to increase. The monthly maximum sustained load now exceeds 90,000 K.W., and I may mention that when the supply to the electrically driven compressors at Robinson Central is included this figure reaches well over 100,000 K.W.

FIG. 4.



A COMPARISON.

It may now be interesting to draw a comparison between the Power Companies' business and that of one or two other schemes. Figure (6) shows the smooth load curves of the Chicago, New York, Johannesburg and Randfontein systems for a single week-end prorated to that of the Power Company. By prorated I mean that the curve for each scheme is proportioned up or down so that it may have the same summit as the Power Companies' curve. I regret that I have not been able to obtain up-to-date curves for the two American schemes, but those shown are no doubt fairly representative. It will be observed that the load factor of the Power Companies' system is higher than that of either of the three companies which supply a miscellaneous collection of different types of consumers, whilst the load factor at Randfontein is higher than that of the Power Companies' system. I should mention, however, that the curve for Randfontein is not strictly representative, as Mr. Batt informs me that the conditions obtaining on the date in question were somewhat abnormal.

The week-day load factors calculated from these curves are approximately as follows: Chicago, 56; New York, [illegible]; Johannesburg, 47.5; Power Companies, [illegible]; Randfontein, 91.5. The period of duration of the upper portion of the peak on the Power Companies' curve, namely, from 9 a.m. to 5 p.m., does not overlap the peak of any of the other curves excepting that of the neighbouring system at Randfontein, which latter also deals solely with supply to the gold mining industry. Taking first the New York Edison curve, it will be observed that this is typical of power and lighting supply to a large city, and shows the usual high peak during the evening. The curve for Johannesburg is quite similar in shape with the exception that there is a minor peak in the morning, due to the traction load, and, of course, the evening peak occurs at a different time, the New York curve being for a winter day in America, and the Johannesburg curve for a summer day in Africa. The Chicago curve shows clearly the benefit which that large concern is securing by the acquisition of a large railway supply. The morning peak is more pronounced, and the average load during the day is a large proportion of the evening peak. The Randfontein curve shows the same period of peak as the Power Companies' curve, but is flatter. The characteristics of the Power Companies' load may be compared with that of, say, Chicago on another basis, namely, by taking the number of hours of use of various percentages of the full amount of plant in service during the peak. These curves, which may be termed "load duration curves," are shown in figure (7). It will be observed that the Power Companies use 90 per cent. of the peak capacity of plant for 1,000 hours per annum, as against less than 100 hours for Chicago, and that 50 per cent. of the plant is used for about 8,400 hours and 2,700 hours, respectively. In other words, the Power Companies use 90 per cent. of their plant ten times and 50 per cent. of their plant for three times as long as Chicago did

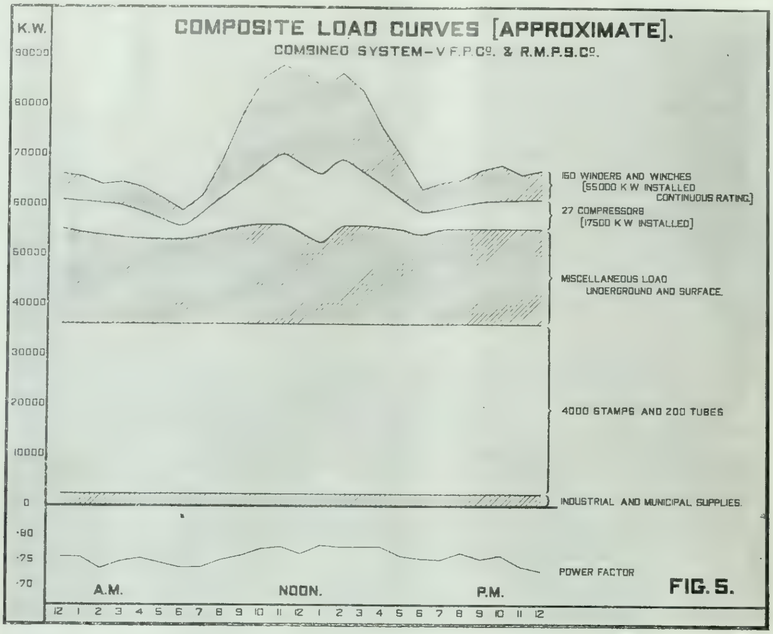


FIG. 5.

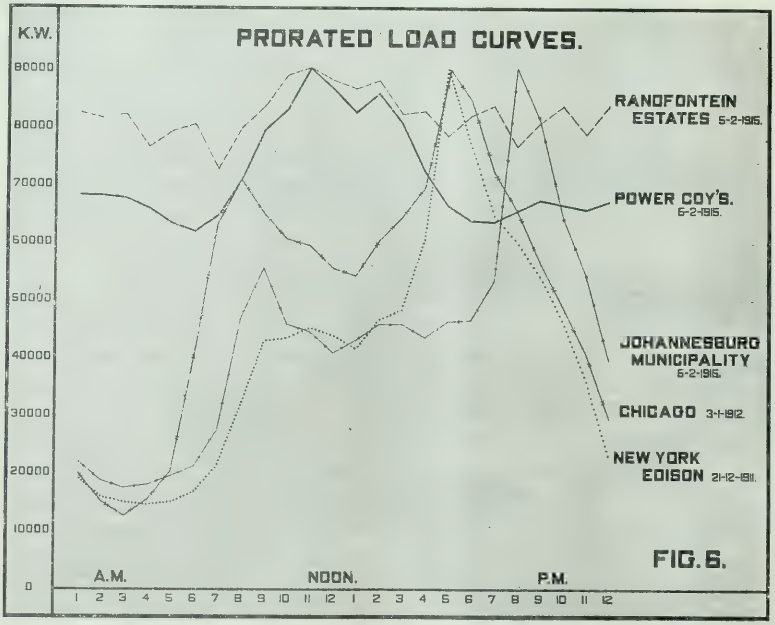
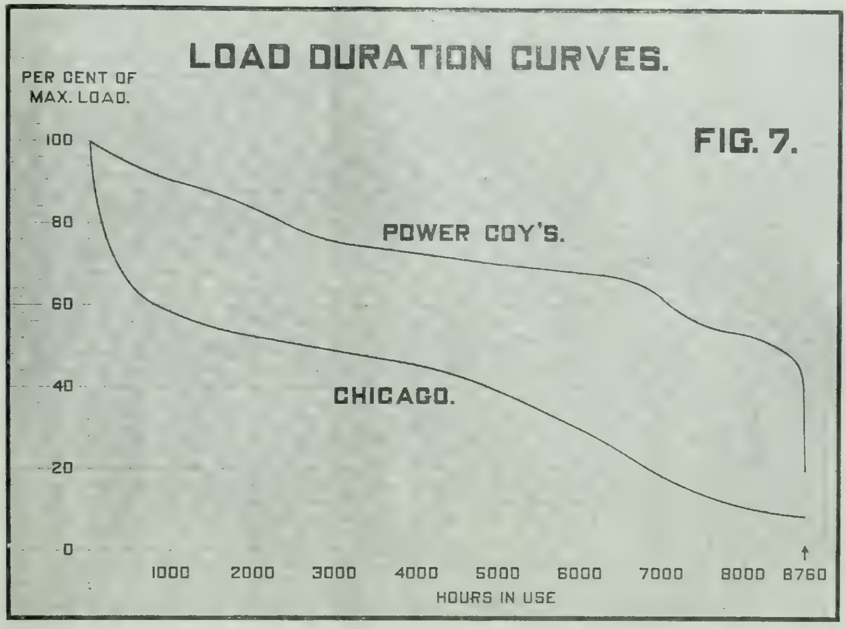
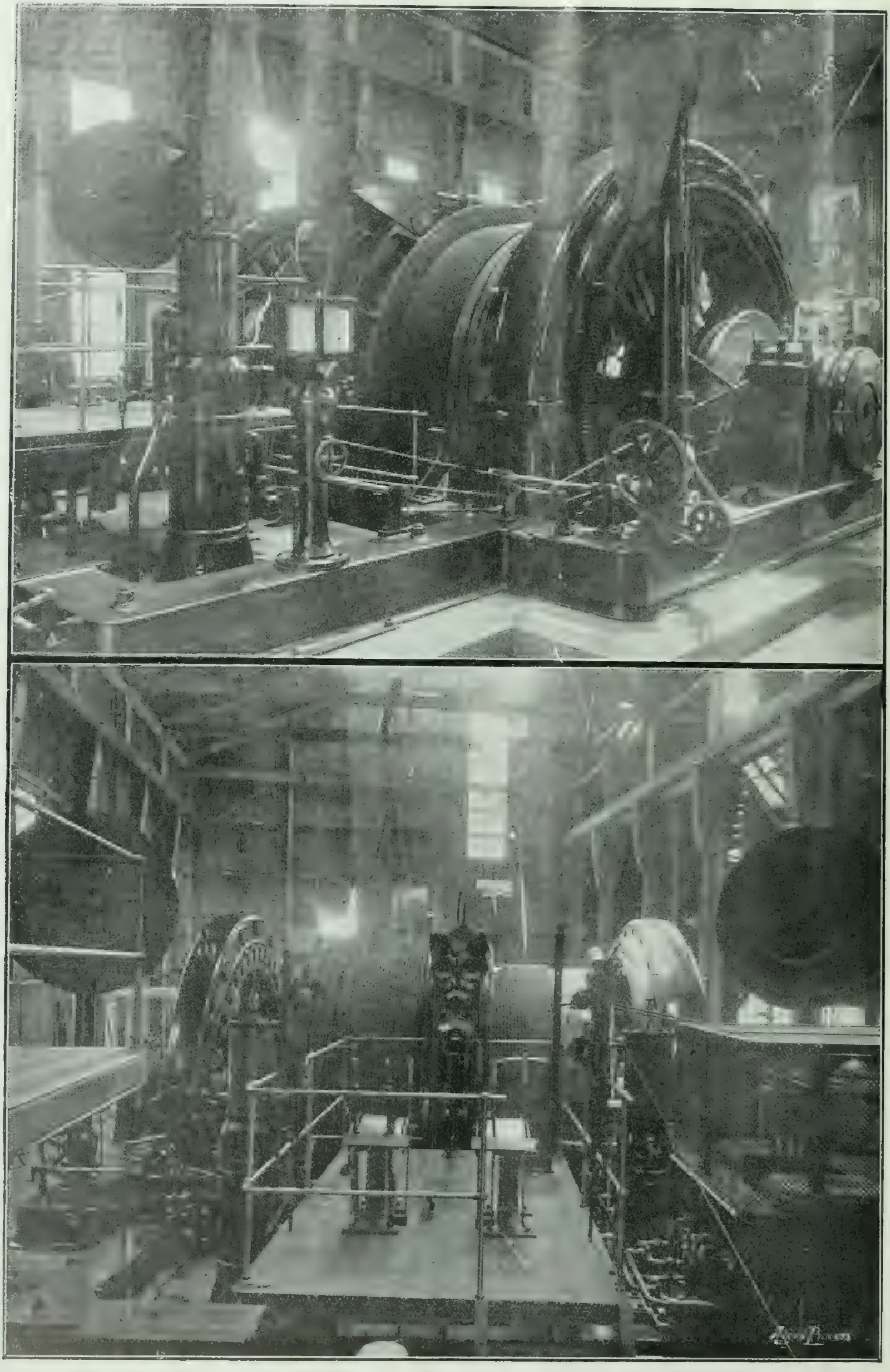


FIG. 6.

in 1912. It will be clear from these comparisons that conditions here on the Witwatersrand are unique. The present method of operating the mines results in a load curve having a peak of considerable duration, but this peak occurs at an unusual time, and would not overlap the peaks on the curves of a traction or a city lighting and power supply if these latter were added to the Power Companies' system. As engineers, we desire to get the best possible results out of our work, as business men, we want to supply the greatest possible amount of service at the lowest possible cost to the consumer, and the greatest possible profit to our own particular concern, but whether we be engineers or business men, or both, we all desire to avoid unnecessary waste of capital of the world's resources. Mr. Ferranti, when addressing the Home Institution in 1910, boldly outlined a scheme for the generation and distribution of electric power for the whole of Great Britain, and showed the enormous saving in capital and in fuel which would result if electricity were to become the universal medium for supplying all heating, lighting and power requirements. I personally believe that some day this vision will materialise in a broad form, if not in detail, and that in the more sparsely populated continent of America the conservation of the country's resources by the aid of electric power will be deemed to be matters of national import. The difficulty is that changes of this order can only mature gradually and small advances do not permit the large economies which would be secured if it were possible for the ideal scheme to be laid out from the beginning. There is nevertheless a vast field for conservation within immediate grasp. The power problem in London is an outstanding instance, and it is gratifying to see that there is at least some prospect of a combination of interests in that important field. America is already leading the way, as witness the rapid development of the Chicago Edison Company during recent years. The strong position to which that vast concern has attained and the resulting benefits to consumers is the outcome of the concentration of various types of supply in one large system, under the enterprising and far-sighted guidance of Mr. Samuel Insull. Here on the Rand, it may be said that the field is a relatively restricted one, but its possibilities have not yet been exhausted. The eastern portion of the Rand promises well, and it is reasonable to hope that a further extension of this vast goldbearing area will some day be discovered. In conclusion, I desire to thank Professor Dobson and Mr. Butt for the load curves which they kindly supplied, and Mr. Campbell and a number of the staff of my own office for the pains they have taken in the preparation of the diagrams and slides which have served to illustrate these notes.



A Typical Transformer House of a Rand Mine.



Electric Hoists as Installed at the City Deep and Turf Mines.

PROGRESS OF ELECTRICAL ENGINEERING IN SOUTH AFRICA.

Being Valedictory Address of Mr. W. Elsdon-Dew, the Outgoing President of the South African Institute of Electrical Engineers.

At the end of the year's work a President is called upon to give a valedictory address, and it has not been an easy matter to me to decide upon a subject on which to address you to-night. When you did me the honour of electing me as your President I was fully sensible of the responsibilities which it entailed, and, in looking back over the year's work of the Institute, we find, owing to the calamitous war now raging, what a difficult time it has been for this Institute and other technical societies to keep up the keen interest in their special spheres which is so necessary to the welfare of all professions. The year has been one of most abnormal conditions throughout the world, and this Institute is to be congratulated on the sustained and I may say improved position in which it now is, and I take the opportunity now of thanking all the Members of Council for the whole-hearted manner in which the interests of the profession have been furthered during this time of stress. It was only by the co-operation on the Council that progress has been made. It is unnecessary for me to dwell on the work that has been done, for your Council's report has covered these matters. I feel that a valedictory address must not be controversial, and although one is likely to be guilty of plagiarism, yet at this time it is opportune for us to review the progress of electrical engineering in South Africa. When considering how this address should be made, my mind reverted to the inaugural address of your first President, Mr. C. W. R. Campbell, given in this room just about five years ago. Now, gentlemen, in this address your first President pointed out how all engineers were working in a circle; we are all dependent on one another, whatever branch of engineering you may consider it will be found that the other branches supply certain necessities that are required for that branch under review, and further, that branch supplies something that the other cannot do without. In electrical engineering we find that without the civil engineer, or the mechanical engineer, or without the chemist and others, our progress would be stopped, and, in turn, that which may be considered electrical cannot be done without the other professions. One can realise that the electrical engineering profession during the last decade has made much progress, and as a civilising agent I do not know if it is possible satisfactorily to review all that has happened through the applications of electrical science. A review of some of the applications as applies in South Africa can only be touched upon lightly, but it will, I hope, stimulate thought and make those who can give consideration of what is possible for the development of this country and which has been made possible by electrical engineering. I will take electric lighting. In the early days, say twenty years ago, it was looked upon as a luxury. To-day, look at its widespread application; a householder who cannot have electric light in his house considers himself suffering under a hardship. We find, for the isolated householder, self-contained reliable lighting sets driven by petrol or oil are available and having extended use. Electric supply in the small "dorps" has progressed satisfactorily, and the high efficiency lamp, although it may have reduced revenue to the supply undertakings temporarily, yet has, by extended use, given greater benefits to the community. The use of electric light in photography has made it possible for work to be continued regardless of sunshine, although here in South Africa we cannot complain for want of the latter. The mercury vapour lamp has assisted in many ways the engineer in his work, where daylight effects are essential to efficiency. The benefits of electric light, as a light, are now so well recognised that one cannot fail to be impressed by the progress made. It is not necessary for me to discuss the economic conditions controlling the supply of electricity for lighting purposes, but the consideration of this condition has made for advance in the cheap supply of power, and consequently development of industries where cheap power is essential. It will therefore be found that all electric lighting stations rely on the power load to assist in reducing costs, and in South Africa full advantage is being taken of this. South Africa has naturally learnt the lesson which pioneer work in electric lighting supply had to go through in the old days in Europe and America. Further development will no doubt tend for cheaper supply of electric light, and it is fully recognised that a cheap supply means development and expansion.

TELEPHONE AND TELEGRAPH EXTENSIONS.

It is gratifying to know that this branch of electrical engineering is doing more for the development of South Africa and its resources than any other civilising agent. The progress made in telephony and telegraphy, and its application to general use has made the business man so dependent on them that nowadays a business man cannot do without them, and to these branches of electrical engineering may be credited the "speeding up" of the world's progress. The telephone and the telegraph have made it possible for proper control from great distances, and one can only realise what this means to South Africa if they view what has hampered during the last four months, when the authorities had to deal with the late rebellion. The wireless telegraph and its latest development we are not as yet so closely connected with here in South Africa, but we are directly affected by its use. The British Navy has been able to maintain control of the sea, and South Africa has only suffered indirectly from the effects of the great war now raging in Europe. What would have been our fate if the experiments of Faraday, Hertz, Preece, Lodge and Marconi had not developed the use of wireless telegraphy, and it is to be hoped that the further use thereof by our brave commanders will assist speedily to bring an end to this terrible war. The development of the wireless telephone is eagerly looked forward to in this country, where we have great distances between towns, and I anticipate that a wide use of this will surely extend and assist the pioneer.

ELECTRICITY IN SURGERY AND X-RAY WORK.

It is not out of place to mention this branch of the profession, for its importance and expansion follow so closely with the advance made in medical science. It has alleviated the sufferings of mankind, and has also saved the lives of many. It is satisfactory to know that in South Africa every advantage has been taken of these advances, for we know, especially on the Rand, that the expenses incurred for such work are always generously provided by this more or less rich community, and when once equipped, the benefits are within the reach of all. This side of the profession is one so closely allied with medical science that we look to the medical man to encourage and call on the electrical engineer to make further advances for him to alleviate the sufferings of humanity.

W. Elsdon Dew, M.I.E.E.

(Fellow A.I.E.E., President 1914 of the S.A. Institute of Electrical Engineers.)

ELECTRO METALLURGY.

On the Rand, some years ago, the Siemens Halske process for the precipitation of gold was much in use, but owing to what one may say the purity of the ore and its freedom from refractory combinations, direct zinc precipitation is now solely in use, but it is fully recognised that refractory ores in the outside districts which have in the past resisted the attempts of the chemist for direct treatment will be successfully treated with the aid of electrical science. Signs are not wanting that the advances being made in this direction will be important and will have far-reaching effects. I may also refer to many operations in electro-chemistry which have been developed in Europe, and which ultimately will have some opportunity for progress in [illegible] vast field for the development [illegible] metals which are now [illegible].

ELECTRIC POWER SUPPLY.

[illegible] of electrical engineering that one sees [illegible]. Here on the Rand we have what may be [illegible] a power supply company as any in the world. [illegible] be realised when it is remembered that the electrical engineer had to build up this great [illegible] scheme, now satisfactorily at work, against much opposition. Gentlemen, I do not say biassed opposition, but such opposition as was difficult to overcome, owing to the inherent conservatism of the mechanical engineer. In mining work, the mechanical engineer had fulfilled all that was asked of him, and the difficulties that the mining engineer had called upon him to overcome had been successfully surmounted. It was therefore natural that radical changes were not looked upon with favour. Fortunately, the electrical profession has made good, and the electrical and mechanical engineers now co-operate in all ways to improve and advance the work entailed, especially in mining problems on these fields. I have some vivid recollections of criticisms levelled at the electrical engineer not many years ago, but now it is gratifying to know that problems are made easier by co-operation amongst engineers generally, whether mining, civil, mechanical or electrical. Gentlemen, if one reviews the position of present day engineering, one is struck with the change from the low speed period to the high speed. It is obvious that the high speed power plants driven by steam turbines has made for reduced capital expenditure, and also it would be recognised that it would hardly have been possible to have built low speed generators of 20,000 k.w. capacity such as you find in use in the power companies' stations here on the Rand. Present day power supply would not have been possible if the combination of the steam turbine with the three phase generator had not made such definite progress. In this way we find that cheap supply of power is made possible by the combination of two types of machinery, each fulfilling its own peculiar functions for the advancement of engineering generally. I would also call your attention to certain conditions in power supply in which the Rand can point to with pride. I refer to the combined station, where electric power supply is carried out together with compressed air supply. Now, gentlemen, the conditions are perhaps unique, but for sound engineering practice and a combination of conditions, one can hardly conceive anything better. The high speed steam turbine driving three-phase generators for electric power supply. A high speed turbo-compressor driven either by steam or synchronous electric motors; a power supply to induction motors where the power factor may become a serious factor if not controlled by some simple means. These conditions here make it possible for the power factor of a large power system to be efficiently controlled. Incidentally, one finds that the load factor of power supply to the mines is unique, and I am sure when one speaks of it as being 70 to 80 per cent., power engineers in other countries will view this statement with a certain amount of doubt. It is naturally of greatest importance this load factor, insomuch that the peak loads on generating plant do not necessitate an excess of standby plant for such peak loads. The higher the power factor the less, proportionately, are the standing charges. If you look at the statistics presented at the Congress in Kimberley of the South African Association for the Advancement of Science, you will find how great the different systems are, and it will convey better evidence than any how much the combination of these conditions go for success and economy. In mining problems, the high speed centrifugal pump is made possible by the high speed motors, and has assisted to solve some of the problems which the mining man has had to overcome for the expansion of the gold mining industry.

ELECTRIC WINDERS.

I do not know where one could go to obtain more information than is available in South Africa on this subject, and, I am sure, the Institute is to be congratulated on having had many of the problems involved discussed at its meetings. At one time it was felt that the electric winder would have a great difficulty to replace the steam winder, which machine had been brought to such a high state of efficiency. These, as well as many other problems, have been overcome in mining work by the electrical engineer, and with this progress it is to be noted that the methods of measurement of power to determine the efficiency of the work being done has also attained a high degree of efficiency, and also simple application for the detection of changes. With electrification, power costs are accurately and clearly allocated, and through this improvements have been made possible in many ways in processes connected with the gold mining industry.

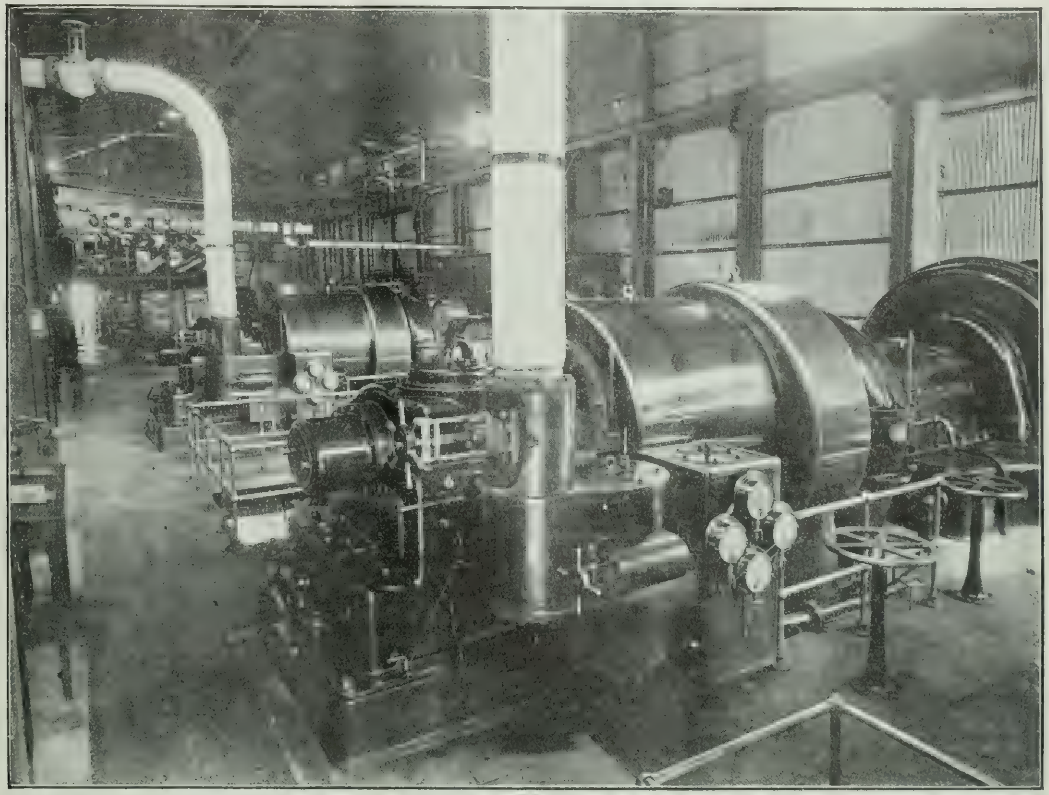
ELECTRIFICATION OF RAILWAYS AND ELECTRIC TRAMWAYS.

The general success of electric tramways in South Africa is so well known that by many it is asked why railway work is not done electrically. It is perhaps to the credit of South Africa that those who control the Union Railways have not experimented in electric railways, but it is now necessary that this is carried out, and the signs are not wanting that proper consideration is now being given to this matter. It must be recognised by those who have any knowledge of the subject that the railways of the Union of South Africa are playing a double part. They are supplying certain necessities that have to be imported, and are opening up the country so that the agriculturist can get his produce to a market or to be exported. I cannot conceive a better method of progress and expansion than by being able to supply cheap power along all railways and within reasonable distances to the railways. Now electrical engineering has made this possible, and although the problem is a big one, yet one can see that it is within the bounds of possibility. There are no difficult problems of engineering to overcome; the difficulties lie in not having a combination of conditions that will tend for expansion, and we find that in this the electrical engineer will have to show the way. We have in South Africa vast fields of coal, ready to be used for power or for the manufacture of artificial manures and other necessities. We have vast bodies of iron ore, and we have a vast country not producing enough to feed its own population. With an extended and combined scheme of using the water power now running to waste together with the use of the coal deposits, either for power, for irrigation or industrial purposes all combined will be for the expansion of the country. Cheap power if available to every man will mean expansion in every way. You will note, gentlemen, that during the year as reported in the Annual Report, your Council appointed a Committee called "Development of Resources Committee," and I wish to call your attention to this matter. In this address I have touched very lightly on the progress made in electrical engineering, and referred to the effect it has had generally in South Africa. I have done so for a very definite purpose, realising that in asking you to review the conditions leading up to the present state of affairs, it is with the intention of taking a lesson from the past. The progress made is enormous, and there is still advance to be made. No one can realise better than the electrical engineer how far reaching has been the progress of the profession. Your Council realised that your Institute has a future before it that cannot at present be gauged, and if one studies the work done and being done by the Home Institute, and also by the American Institute, we find that your Institute is gradually taking up its burden in so far as South Africa is concerned. The aims and objects of your Institute are definite, and while your Council will naturally foster and assist in having papers and discussions at their general meetings, your Council has still greater work to perform. A technical institution is naturally looked upon to direct the interest of the public in the matters pertaining to its profession. The advance made in electrical engineering and the far-reaching effects it has in the development of a country such as this, is too important to be only spoken of in a general manner, and in this way this Committee's work is most important and also far-reaching. I do not propose to deal with the work proposed to be done, but in mentioning that it is under the direct chairmanship of your new President, and as I understand he proposes to give you some information on the subject in his presidential address, I think that is all that is necessary for me to say.

During my time of office the co-operation of the Council and the members of the Institute, and their keen perseverance in carrying out ever increasing duties, has made me realise more than ever that the right spirit permeates throughout, and will ensure that the profession in South Africa continues in its honourable career. I feel proud that during my year of office the Institute's progress has been so well maintained, and the wider influence it is now having in matters that affect the progress of electrical engineering in South Africa gives us confidence that the objects of the Institute are being attained. Now I am retiring from the chair, I do so having still greater faith and with a feeling of hope and confidence for the future in the Institute's work in South Africa.

Transfer of German Electrical Trade.

It is obvious enough that the mere temporary capture of German trade in no way necessarily involves its retention, but at the same time we (says "Engineering") do not admit that if that capture takes place it will be as easy for Germany to regain her position as it would have been for her to hold the position had she never lost it. This may be indirectly illustrated from the history of the very electrical industry with which we are dealing. The United Kingdom was at one time in the forefront in electrical manufacture. We think we are correct in saying that in the early 'eighties Crompton's works were the largest in the world. Our fall has been variously explained, as we have already said, but much weight has been laid on the Electric Lighting Act of 1882. There is much in the idea. If a business can build up a large connection in the early days, when pioneering profits can be made, it is likely to establish a financial and technical position from which it is difficult to move it afterwards. The Act referred to is certainly reflected in our present condition in that it hampered our manufacturers just at the time when they were establishing the premier position. Having lost that position, they now find it extraordinarily difficult to make headway against the stand secured by the manufacturers of other countries. Briefly, it is generally easier to keep the lead than get it. We had it, but failed to keep it. The application of this lesson to the present state of affairs is obvious. Germany is necessarily for a time going to lose export trade in electrical apparatus worth over £10,000,000 a year. This is a blow to her established position which our manufacturers in the ordinary course could never have hoped for. If they use their opportunity aright, they may not only obtain some of this trade temporarily, but, what is more important, may build up an improved position for themselves in home and oversea markets which will enable them in the future to face German and other competition on a surer basis than in the past. There is an opportunity of doing something to retrieve the position thrown away thirty years ago.



Johannesburg Municipal Power Station, Interior.

ELECTRIC POWER SUPPLY ON THE RAND.[*]

Full Authoritative Account of the History and Scope of the Power Companies on the Rand.

By A. E. HADLEY, Managing Director of the Victoria Falls and Transvaal Power Company, Ltd.

INTRODUCTION.

Formation of Company.—The Victoria Falls and Transvaal Power Company, Ltd., was formed at the end of 1906, with the object of supplying power in South Africa and Rhodesia, and of acquiring the concessional rights to develop the Victoria Falls. Under the original proposals a supply to the Rand was to be given partly by transmitting power from the Victoria Falls, 700 miles distant, and partly by steam generating stations situated on the reef. The author became associated with the company shortly after its formation and after its original proposal had been modified through giving up the plan to supply part of the requirements of the Rand with power from the Falls. The increase in the coal supplies in the Transvaal bringing about a reduction in the price of local fuel, the necessity for securing power without any delay, and the objections raised by various vested interests to the importation of power from outside the Colony, were among the principal reasons for delaying the development of the Falls until the population of Rhodesia increased or until the demand in South Africa for manufacturing sites with cheap electric power available justifies the expenditure. It was therefore decided to supply the Witwatersrand from steam plant using local fuel. The great demand for power on the Witwatersrand has arisen through the extraordinarily successful development of the gold mines on the reef, which, although only discovered in 1886, now produce 38 per cent. of the world's output of gold. Further, it is estimated by the leaders of the gold mining industry that the work of raising gold will still be in progress on the Rand one hundred years hence.

Electric Power on the Rand.—Turning for a moment to the history of electric power on the Rand, a few details will be of interest. Siemens and Halske were the first to obtain a concession in 1894, and formed the Rand Central Electric Works, Ltd., in 1895, which had a plant aggregating 3,200 kw. capacity in 1906. Another concession was obtained by the Simmer and Jack mine in 1897, from which the General Electric Power Company was established in 1906, with plant having a capacity of 2,500 kw. In 1905 Messrs. Lewis and Marks, having in view the possibility of supplying the Rand from their coalfields at Vereeniging, 35 miles south, commenced obtaining wayleaves for a pole line, while certain European companies sent out representatives to report on the prospects. The Victoria Falls Company ultimately took over the two existing supply companies in 1907 and purchased the Vereeniging wayleaves from Messrs. Lewis and Marks, at the same time entering into an agreement with them for the right to establish a power station at Vereeniging. In 1907, pending the installation of modern plant, a supply totalling 4,000 kw. was given from the existing steam stations which had been purchased. As soon as it was appreciated that a cheap power supply was available, the mining groups entered into contracts with the company, and the demands for power have since increased so quickly that it has throughout been the greatest difficulty for the company to raise capital and install plant rapidly enough to satisfy the demand. In 1908 the largest group of mines, viz., that controlled by the Rand Mines, Ltd., and Messrs. Eckstein and Co., decided to change over their mines to electric driving. In addition to the supply of electricity to this group of mines, the conditions called for the supply of compressed air for working the rock drills. These mines agreed to purchase the whole of the power they required and to shut down all their existing boiler plant, whereas the other groups are not bound in this way, but have contracted to take electricity from no other power company, and to continue to take any supply required by them exclusively from the power company. There was a further stipulation in the case of the Rand Mines group that the supply should be given by a company to be formed for the purpose and registered in the Transvaal. This led to the registration of the Rand Mines Power Supply Company, Ltd.; the entire capital of which has been provided by the Victoria Falls Power Company. The two undertakings are working under separate licences granted by the Government in terms of a Power Act passed in 1910, but are operated by the same management and staff. The systems supplying the power, however, are kept as distinct as possible, but they may be treated here solely from an engineering point of view as one undertaking. The peak load of the combined undertaking has reached 105,000 kw., and the sales average 1,750,000 units per day. These figures include the sales of compressed air by the Rand Mines Power Supply Company to ten mines. The air units represent practically the same amount of energy as if these ten mines had converted their compressors to electric drive and purchased electricity. When the further demands for power which have already been notified are met by the plant now on order, the sales will reach 2,000,000 units daily. The monthly load factor, based on the hour of maximum output, varies from 70 to 74 per cent.

Terms of Supply.—The chief mining groups, with the exception of two who had already established their own private stations, have contracted with the Company for a power supply for periods of twenty and twelve years. The supply is furnished to all mining consumers at 2,100 volts and 525 volts. The necessary step-down transformers and switch-gear are provided by the power company, while the consumer supplies the sub-station building and pays the power company a sum equal to 2 per cent. of the power bill to cover the losses in the step-down transformers. The standard price in mining contracts covering not less than twelve years is 0.525d. per unit, as long as the monthly load factor is above 70 per cent., the load factor being based on the hour of maximum consumption. This price is subject to periodical revision depending upon the cost of production, and further, a participation with the consumers in the profits of the business after a due return has been paid on capital is also provided for. In the case of a failure of the supply the consumers are entitled to a payment from the power company of seven shillings per hour for each 100 kw. put out of commission. The introduction of these prices on the Rand has reduced the cost of power to the mines by 40 per cent., and has reduced the cost of production of gold by an amount varying from sixpence to a shilling per ton of ore milled. It has further resulted in considerable saving of capital expenditure on plant, which in the case of a new mine may amount to £100,000.

Area of Supply.—The gold is contained in a conglomerate rock which dips to the south and is generally supposed to be the northern shore of an ancient lake. The outcrop mines were the first opened; but with the improvements in mining machinery deep-level mines have been started to strike the reef lower down, and the farthest of these from the outcrop is about two miles. The area over which a power supply had to be given lies therefore within a strip about two miles broad and stretching 50 miles from east to west. The total power used by the mines at the present time is estimated at about 400,000 h.p. The town of Johannesburg, which has its own electric plant, is situated about the middle of this strip, while the township of Germiston, about nine miles to the east, is supplied by the company.

POWER STATIONS.

The initial power stations were laid out in order to allow of considerable extension, as the immediate future demand could not be accurately estimated. The local water supply conditions restricted the choice of the station sites to certain artificial lakes situated along the reef and to the Vaal River, which runs parallel to the reef, and is 35 miles south. Power plants aggregating 204,200 kw. have been installed in, or are under construction for, the stations enumerated in the following table. They are set out in the order in which they were built:

Name of Station.	Total Capacity of Electric Generating Plant Installed.	Steam-driven Air Compressors Installed.
Brakpan	Two 12,500-kw. sets	—
	Two 3,000-kw. sets	—
Simmer Pan	Six 3,000-kw. sets	—
Rosherville	Two 11,000-kw. sets	Six 3,500-kw. machines and
	Five 9,600-kw. sets	three 7,000 kw. machines
Vereeniging	Two 9,600-kw. sets	—
	Two 12,000-kw. sets	—
	162,200-kw.	42,000-kw.
Total capacity of plant installed and in progress		204,200-kw.

At Robinson Central air station there are also six electrically-driven air compressors each of 3,500 kw. capacity. At all stations steam turbo-electric generating sets are employed and produce three-phase energy at 50 cycles. Step-up transformers raise the generator pressure to 40,000, 20,000 or 10,000 volts, and their interposition gives additional security to the machines against pressure rises. This method in which there is a choice of generator voltage, gives the further advantage of allowing the stators to be constructed with bar winding having one bar per slot. There is a general resemblance in the lay-out of all these power stations, modifications being introduced to suit varying local conditions. A description of the largest plant, that at the Rosherville Dam, is given later, as being representative of the general design.

ELECTRICAL TRANSMISSION SYSTEM.

The main system of transmission (shown in Fig. 1) is effected by means of 40,000-volt overhead lines stretching practically the whole length of the reef. At the present time, however, the western extremity is working as a 20,000-volt distribution line. Where the load is most dense the transmission system consists of two rows of towers each arranged to carry two circuits. The 40,000-volt transmission system is fed at four points, namely at Brakpan, Simmer Pan, Rosherville and at Robinson Central, where the supply from the Vereeniging station joins the reef. In addition to these distribution stations the transmission lines pass through two further distributing centres at Hercules to the east and Bantjes to the west. From these six points distribution networks, laid out as ring mains, supply the various sub-stations on the mines. The three eastern distribution stations supply the system through 10,000-volt overhead lines. The central portion of the area is served by an underground 20,000-volt cable system, and the western distribution network as previously mentioned, is working at 20,000 volts by overhead lines. The Vereeniging station is connected to the Rand by an 80,000-volt line approximately 35 miles long.

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[*] Paper read before the Institution of Electrical Engineers—the only paper that has ever attempted to give a complete account of the subject, revised and brought up-to-date.

terminating at the Robinson Central distribution station, where the pressure is transformed to either 40,000 or 20,000 volts, these pressures being also coupled together through transformers aggregating 16,000 k.v.a.

80,000-volt Pole Line.—This line consists of two rows of [illegible] steel masts equipped with four circuits of stranded copper, each conductor having a section of 60 sq. mm. and carrying three earthed guard wires above the conductors. Every fourth mast (known as an "anchor mast," Fig. 2) is of sufficient strength to take the full strain of the conductors in a lateral direction; and the three intermediate masts (Fig. 3) are designed to take the strain due to wind pressure in a direction transverse to the line. Extra anchor masts are also used whenever the line changes its direction, and at railway crossings. A special end tower (Fig. 4) is used at the ends of the line. The masts are normally spaced 500 ft. apart. The anchor masts have an overall height of 74 ft. 6 ins., the lowest cross arm being 34ft. 6 ins. from the ground. On these masts the conductors are placed vertically above each other, and are separated by a distance of 9 ft. Each mast was required to deflect [illegible] in. at the top when subjected to a horizontal pull of 4[illegible] tons applied 44 ft. from the ground at an angle of 30 degrees to the direction of the line. The intermediate masts when carrying the weight of the insulators, conductors and guard wires, were required to give a temporary deflection at the top of 11-16 in. when subject to a horizontal pull of 35 [illegible], applied 35ft. from the ground and at right angles to the line direction. The conductors on these masts are arranged three on each side, in the shape of an equilateral triangle having sides 8 ft. long. The lowest support for the conductors is 34 ft. 6 in. from the ground, and a 10 ft. sag is allowed, so that the lowest part of any conductor is never less than 24 ft. 6 in. from the ground. All masts are provided with a safety screen to prevent any possibility of men working on one circuit coming into contact with the circuit on the opposite side of the pole. This screen consists of a rectangular steel framework interlaced with galvanised steel wire netting. The 80,000-volt insulators used are of the disc type, 10 in. in diameter, and connected 6 in series at each suspension and straining point. Before erection each insulator is subjected to a mechanical stress of 1[illegible] tons, and while in this condition is tested to 60,000 volts for 5 minutes. The latest type of 40,000-volt transmission line is of a similar design but pin insulators are employed on the intermediate lattice masts, and 4 discs are used in each string of insulators on the main towers which take the lateral strain. All the 20,000-volt cables have circular conductors of 100 sq. mm. section, and are paper-insulated, lead-covered, and armoured (Fig. 5). Each cable is capable of transmitting about 7,000 k.v.a. The cable was specified to stand a test pressure at the factory of 50,000 volts, and a test pressure of 40,000 volts for 10 minutes after laying. The system has been laid out so as to be operated during the development of the undertaking as a single system, but arranged that when the growth of the load made it desirable (both from the point of view of economy and also of safety of supply) it could be sectionalised without the necessity of running additional machinery.

Protective Arrangements.—All transmission and distribution circuits, with the exception of the long-distance 80,000-volt lines are equipped with the Merz-Price balanced relay system for automatic switch control without which a reliable supply on the ring main system could not have been given, and the more expensive radial type of network would have been necessitated. This balanced relay system is also employed for the protection of all transformers and for the large generators. The pilot wires for operating this system on the 40,000-volt transmission lines are combined with telephone circuits in a lead covered cable suspended overhead, while on all distribution networks (both overhead and underground) combined pilot and telephone cables are laid underground.

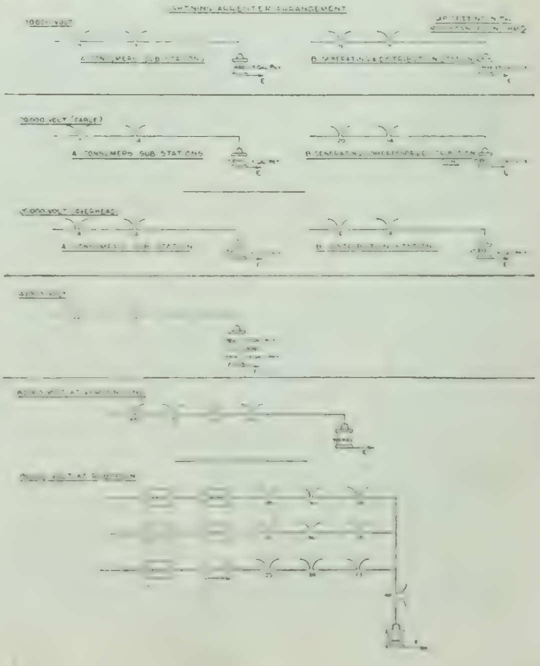
Normal Control of Operation.—A complete telephone system has been installed connecting up all points on the transmission and distribution system and the residences of the staff. A special feature of the lay-out of the telephone system is the arrangement whereby the control of all switching and the control and regulation of load, voltage, power factor and other operating conditions, are in the hands of the control department. Great importance is attached to the organisation whereby the control of the whole system when in operation is in the hands of this department, thereby greatly increasing the safety both of the engineering staff and of the supply. By means of the arrangement of the telephone system mentioned above, one control engineer or load dispatcher is responsible for all routine switching and linking carried out at any point on the electrical system during his shift, and under the regulations no switching can be carried out without his consent. The load dispatcher, as soon as any switching has been carried out, adjusts a large diagram in the control room so that it shows every connection on the system.

LIGHTNING AND ATMOSPHERIC CONDITIONS

The atmospheric conditions on the Rand are in many ways abnormal, both in summer and winter. During the winter violent wind and dust storms are encountered, while for six months during the summer (from September to April) the reef is the centre of frequent and violent lightning storms accompanied by heavy rain and sometimes phenomenal hail. Fortunately there is no trouble from ice, and snowstorms are almost unknown. The Rand, which is the watershed of that part of South Africa, is probably about the worst district in the world for lightning, the altitude of Johannesburg being 5,700 ft. At this altitude the range of temperature is very large and rapid changes in temperature occur, disturbing the atmospheric conditions. The total number of lightning storms passing over different sections of the system during the last season which lasted for 182 days amounted to 199. Most careful daily records and observations are taken of all atmospheric disturbances, and these records show that lightning is encountered on an average [illegible] every [illegible] days. The storms of varying severity passing over the different sections of the system are about equal in number, but the number of severe storms at the far west and the far east is considerably greater than the number experienced in the central area of the reef, being over 25 per cent of the total in the former case, while in the central area it is only 14 per cent. Every storm exerts some influence of greater or less severity upon the overhead system, but year by year the number of troubles caused has been largely reduced, so that interruptions to the supply are now infrequent, and the loss of apparatus seldom takes place. As a general rule the effect of lightning is brought about through an induced effect on the overhead lines setting up a high-frequency surge. Experience goes to prove that the intensity of the induced effect is in the majority of cases localised to some part of the transmission line, and only in the minority of cases does it reach the end of the line with its full severity. Further, it is a curious fact that though [illegible] no [illegible] has [illegible] been known to be actually struck by lightning; and it is possible, though not determined, that this may be the result of the earthed guard wires.

PROTECTION FROM ATMOSPHERIC DISTURBANCES.

The means whereby the effects of lightning have been prevented in the great majority of cases from disturbing the system are mainly: (a) the employment of earthed overhead guard wires; (b) earthing the neutral of each separate section of the system; and (c) by careful selection and adjustment of lightning arresters to deal with the different conditions arising. When the work was first started four years ago a considerable amount of overhead transmission line which was not provided with guard wires was taken over from the old company, and the neutral of the system was also not earthed. Little accurate information then existed regarding lightning arrestors, consequently many interruptions of the service occurred and apparatus was frequently damaged. In analysing the effects of any lighting disturbance, it has proved difficult to trace definitely the effect of any individual protective apparatus. Experience has shown, however, that the guard wire constitutes one of the most efficient systems of line protection, and contributes largely to successful operation during storms. During the earlier lightning seasons the neutral of the system was not earthed, and unquestionably many interruptions and much loss of apparatus resulted from not employing this system. One of the troubles caused by lightning is occasioned by the arcing-over of insulators, which with an insulated system having considerable capacity to earth, generally results in an intermittent arc to earth, thereby setting up dangerous surges in the system. These surges lead to cumulative trouble and cause discharges on the arresters of the other two phases, increasing in severity until finally a second flash-over takes place (generally at the arrester gap itself) and short-circuits the phases. By earthing the neutral through a resistance, any arc to earth is immediately isolated by the operation of the Merz-Price balanced relay system, and the arresters are not called upon to continue operating. A star-delta transformer is employed for earthing to avoid disturbance to telephones. Since the neutral of the system was earthed it has been found that in the majority of cases where an arc has occurred over a line insulator the fault has been isolated so rapidly as to prevent damage to the insulator, and the line has been immediately put back into service by closing the switches.



[illegible] the aluminium arrester was [illegible], and in its place a complete system of horn [illegible]. Continuous records have since been [illegible] discharges occurring on these arresters, and [illegible] productive of much instructive data. The number of [illegible] on each of the phases with an earthed neutral has been found to be equal, and of 2,160 discharges recorded between October 1913 and April 1914, 33 per cent. occurred on each phase. The best combination of the number of horns, the spacing of arc gaps, and the amount of resistance to earth, had to be determined by experience and experiment. Fig. 6 shows some of the combinations, which, without claiming that they are the best possible, have proved satisfactory. The danger of mechanical damage arising from violent wind storms has been provided against in the design of the supporting towers, and few troubles have occurred from this cause. Formerly, with an insulated neutral the passage of the wind over the wires produced marked static potentials relative to earth on the transmission lines, but the earthing of the neutral is an effectual safeguard against this.

ROSHERVILLE POWER STATION.

When the contract with the Rand Mines, Ltd., was concluded, the site for the station was selected at the Rosherville Dam, which is the largest lake on the Rand, being enclosed on the southern side by a dam. It will be seen from the table given on page 5 that this station has a capacity of nearly 100,000 kw. of plant installed.

Buildings.—The turbine room is 450 ft. long and 75 ft. wide, and there are five right-angle boiler bays each containing eight boilers. The general lay-out is shown in Fig. 7. The station buildings are of steel construction, in which the size and weight of each member has been kept small in order to reduce the cost of transport.

Coal-storage Plant.—The coal storage arrangements are very complete, the coal being discharged from a height of 14 feet through the floors of 40-ton railway trucks into outside storage bunkers, under which coal conveyers are arranged. The whole structure is open, as roofing is unnecessary owing to the favourable climatic conditions. The conveyers, each capable of dealing with 40 tons of coal per hour, run in tunnels under the external coal store, and are fed with coal by gravity through shoots from the coal pile above. These conveyers are kept running practically continuously, allowing the internal coal bunkers in the boiler house to be of small capacity. An automatic tip is fitted over the bunkers, which tips the conveyer buckets when the coal in any particular bunker has fallen below a certain level. Weighing machines are installed in the conveyer tunnels, and the coal is weighed as it passes in the conveyer buckets. The ashes are discharged from the rear of the stokers into hand trucks in the basement, where natives push the loaded trucks out and attach them to a motor operated rope haulage leading to the ash dump. The question of removing these ashes by suction is at present under consideration. The class of coal burnt at this and other Rand stations is mostly the small coal from the collieries in the Middelburg district 60 miles distant, mixed with a proportion of the duff produced by the coal-cutters. The coal has an average calorific value of about 11,000 B.Th.U.'s per lb.

Boiler House.—The large percentage of ash, viz., 18 to 25 per cent. of the coal, and the high load factor at which the plant is operated, necessitated a combination of boiler, superheater, and economiser, that would give the highest possible efficiency; and the high cost of white labour and the inefficiency of that of the native, also required that the plant should be mechanically operated. In view of these considerations and the great cost of construction work in South Africa, the ejector system of induced draught (Fig. 8), originally [illegible] by Mr. Prat has been adopted in all the power stations. Previous to the installations at Brakpan and Simmer Pan very little attention had been given to this method of boiler-house operation, and its adoption was in the nature of pioneer work. The system has been found to give the utmost satisfaction. In the lay-out employed, adjacent boiler units are connected to a common ejector chimney, the top of which is 90 ft. above the boiler-house floor. An electrically driven rotary fan capable of developing 75 h.p. blows cold air through the ejector situated in the chimney, thereby producing the necessary suction in the flues, and a draught of about 1 in. is usually employed. With this arrangement great flexibility in the boiler house is obtained, and by the use of a torpedo-shaped damper in the air pipe regulating the pressure of the air jet, the duty of the boiler unit can be easily regulated to suit fluctuations in the load. The plant is absolutely smokeless, and it is difficult by looking at the ejector chimneys from outside the station to tell which boilers are at work. The boiler unit selected is the Babcock and Wilcox marine type, fitted with chain-grate stokers, each having an integral superheater and economiser. The boilers are arranged in two rows in each boiler house, with a central and common firing floor. Each boiler has a rated capacity of 32,000 lb. of steam per hour at a pressure of 220 lb. with a temperature of feed water of 100° F., and is capable of producing 38,000 lb. of steam without undue forcing. The heating surface of the boiler is 5,520 sq. ft., of the superheater 1,720 sq. feet, and of the economiser 2,200 sq. ft. A six hours' test on one of the boiler units gave a combined efficiency of boiler, superheater, and economiser, of 80 per cent.

Turbine Room.—The turbine room at present contains five turbo-generators each of 12,000 k.v.a., and six steam compressors each having an input of 3,500 kw.; three more steam compressors each taking 7,030 kw. are also being installed. The turbines are of the A.E.G. Curtis horizontal type, having one high-pressure wheel with three rims of blades. The admission pressure at the intake nozzles is brought down from 220 lb. at a temperature of 300°–350° C. to about 20 lb. with a superheat of about 20° C. In the low pressure portion of the turbine the steam is expanded through 12 stages. Both hand and motor regulation of the speed are arranged for. The total weight of a 12,000 k.v.a. turbine set, including condenser and pumps, is 370 tons.

Generators.—The stators of each of the 6-pole generators are bar wound, having one bar per slot. The machines running at 1,000 revs. per minute produce 50-cycle three-phase energy at 5,000 volts, which is stepped up to either 10,000, 20,000 or 40,000 volts, by transformers directly connected with the stator terminals. Substantial clamping is employed on the end windings of the stator so as to withstand short-circuits. The rotor coils are lined with metal casing before being attached to the rotor by dovetailed groves and wedges. The rotor carries a ventilating fan at each end. The frequent dust storms in South Africa charge the air with heavy particles which might prove dangerous in the ventilation of the machines, consequently each machine is provided with an air filter having an effective surface of fireproof cloth of 8,000 sq. ft. Each turbine set is provided with a direct-driven exciter, while a standby supply is also available from a motor-generator and battery.

Condensing Plant.—The condensors have a cooling surface of 17,750 sq. ft.; each set has a centrifugal circulating pump of about 663,000 gallons per hour capacity, and a centrifugal air pump, both connected on one shaft and driven direct by a steam turbine. The exhaust from the auxiliary turbine is taken to the middle stage of the main turbine, where the remaining energy in the steam is utilised down to the vacuum of the condenser.

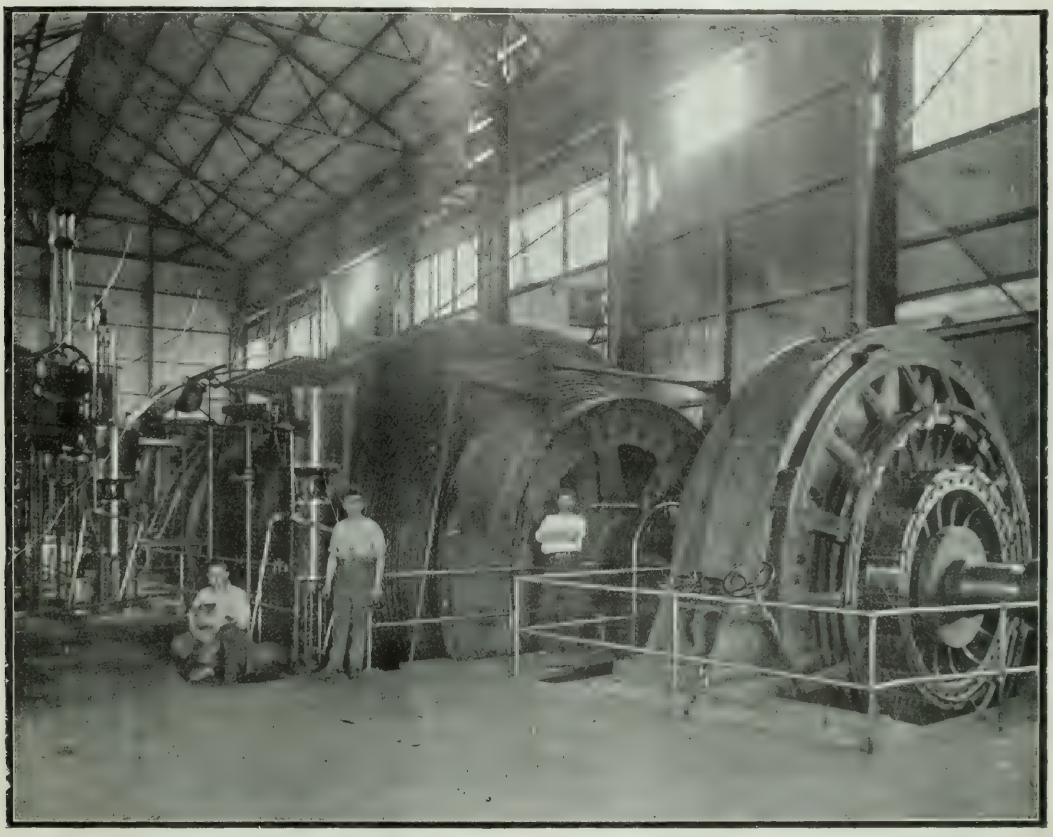
Circulating Water Feed Pumps.—The water for the condensors and compressor jackets is taken from the lake through a channel excavated along the front of the station, and is discharged into a second canal placed alongside the intake; this canal re-delivers the warm water to the lake at a point as far from the intake as possible. Under normal conditions of water levels the intake water flows by gravity into the service canal, but in order to deal with periods when the water in the lake may be low, a pumping station has been erected half way along the dam wall at the deepest part of the lake. This pumping station is fitted with vertical submerged motor-driven pumps, which take the water from the bottom of the lake and discharge it through pipes into the service canal.

Feed Pumps.—The boiler feed pumps are of the turbine-driven centrifugal type, and are installed in the turbine room. With the exception of certain electrically-driven bearing-cooling pumps, all auxiliaries are turbine-driven.

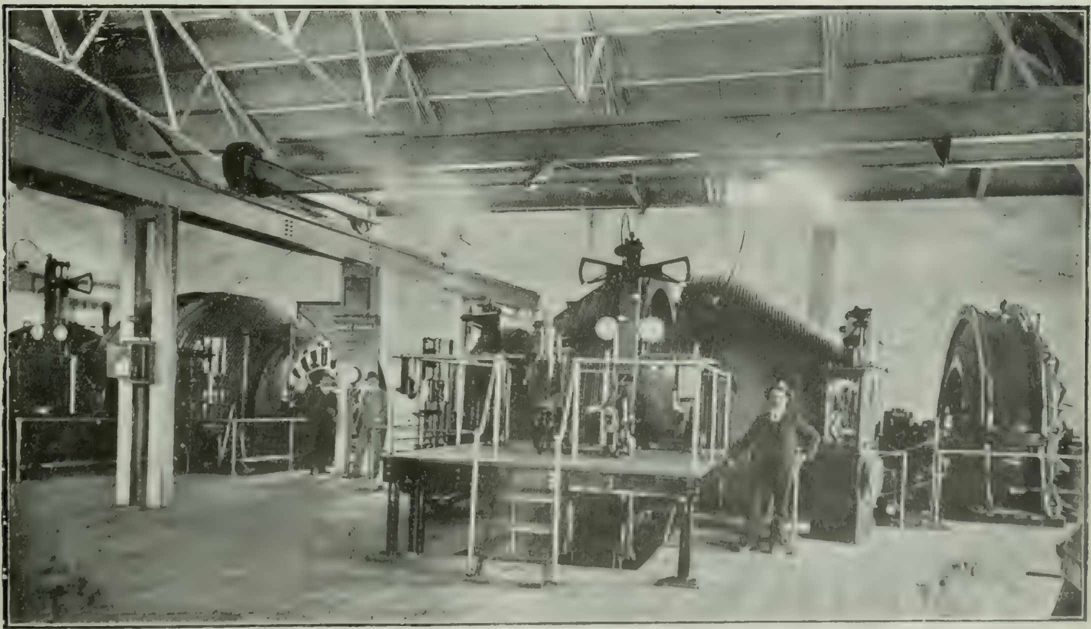
Generator Transformers.—These are connected by cables to their corresponding generators, and are each of 12,500 k.v.a. capacity. Where larger transformers have been required, as for the last two sets at Vereeniging, two transformers for each machine have been installed. The transformers at Rosherville are of the shell type and water-cooled, the windings nearest the terminals being specially insulated to withstand between adjacent turns a pressure of 25,000 volts for five minutes. A test pressure of 160,000 volts was applied to the whole of the windings. The weight of each transformer complete without oil is 50 tons; the oil itself weighs 21 tons.

Turbo-compressors.—The steam turbo-compressors at Rosherville are similar to the motor-driven compressors at Robinson Central, and are each designed to deal with 22,000 cub. ft. of free air per minute with an outlet pressure of 9 atmospheres (absolute). The power required on the shaft is roughly 3,500 kw. In the case of electrically driven sets at Robinson Central each unit is divided into two halves on separate shafts, each motor having a capacity of about 2,000 k.va., and being designed to operate at full load at a leading power factor of 85 per cent. The sets run at 3,000 revs. per minute. The steam-driven compressors are arranged in two sections on the same shaft with an intercooler between them. The cooling water required for the jackets of the compressor and intercooler amounts to about 40,000 gallons per hour. The air leaves the compressor at a temperature of about 70° C. Between the compressor and the pipe line an automatic non-return valve is fitted, which allows a compressor to drop out to atmosphere when its pressure falls below that of the air system. By the use of the rotary compressors the air entering the pipe system is kept entirely free from oil and other impurities liable to be introduced into the air system when piston compressors are employed. The speed regulation of the steam turbo-compressors is automatically controlled by the pressure in the air pipes. The regulation of the electrically-driven compressors at Robinson Central is effected by throttling the intake. The weight of a turbine-driven compressor, condenser, and pumps is 180 tons.

Switchgear.—The switchgear is laid out in a building at the southern end of the station, and the step-up transformers are in cubicles arranged along the outer side of the switchhouse. The last mentioned is constructed with four floors: the upper floor contains the lightning-arrester gear, the third floor the busbars, the second floor the 40,000- and 20,000-volt oil switches, whilst the lower floor is occupied with cableways and pipe-passages. Duplicate busbars are installed for both the 40,000- and 20,000-volt systems, the various oil switches being provided with knife selector switches to connect to either busbar. The 40,000- and 20,000-volt systems are connected together through coupling transformers. The switches consist of three single-phase coupled switches operated from a remote control board. Fig. 9 shows the diagram of connections. Since the Rosherville station came into commercial service, troubles have been experienced owing to failures of switches on short circuit. When the Brakpan and Simmer Pan stations were started to supply the 40,000-volt transmission and also the 10,000-volt local lines, their total capacity was 24,000 kw., and no trouble was experienced when a short-circuit occurred on the system. When, by the addition of Rosherville, the system grew to 60,000- and 70,000-kw. capacity, switch breakdowns occurred conclusively proving that no apparatus was available which could be relied upon to interrupt the immense rush of current



South Rand Shaft of the Crown Mines.



Electric Winders, Rand Collieries.

[illegible] Some serious line interruptions have in the [illegible] the [illegible] throwing of bare wires over the lines. [illegible] total short circuit has occurred near a power station [illegible] has usually been lost. Dynamos running at a high speed [illegible] a low internal reactance. The step-down transformers in the [illegible] were designed with a low reactance to give a good regulation, [illegible] probably the total reactance in circuit on a short [illegible] about 7 or 8 per cent. The momentary rush of energy on [illegible] would therefore reach the tremendous proportions of [illegible] kw. No switch as at present designed could interrupt this rush of power unassisted. The intensely hot gases formed [illegible] after passing through the oil come into contact with the air and cause an explosion, which more often than not is productive of a [illegible] failure. About the time that this trouble became apparent on the Rand exactly the same difficulty was being experienced on stations of similar large output in America, and the problem was [illegible] tackled over there. Many methods have been tried at Niagara, Chicago and other places, and it has become generally recognised that it is necessary to insert additional reactances in order to limit the rush of energy on short circuit. In certain cases this precaution has proved entirely satisfactory. In others additional methods of assisting the oil switch have been necessary, such as (i) sectionalising the system on to separate busbars and limiting the amount of machinery that would be affected by one short circuit; (ii) the placing of two switches in series timed so that one opens first and inserts a non-inductive resistance, the circuit being actually broken by the second switch; (iii) the use of a special type of switch having two moving systems, one of which first introduces reactances, and the other then breaks the circuit. These methods have been tried on the Rand. The earthing of the neutral through a resistance has proved most valuable, as more than 90 per cent of the faults start as faults to earth. At Rosherville and Vereeniging reactances having a value of about 6 per cent have been installed between the dynamos and the step-up transformers. The latest practice is to design both generators and transformers required for power service with large internal reactances. At Vereeniging and the Rand end of the 80,000 volt line two systems of switching have been installed. On the first two Vereeniging machines two switches are employed in series, one introducing a non-inductive resistance; while on the last two machines, both of which have not yet been put into service, a two-movement reactance switch is being installed. This switch is constructed on the lines of an oil-break switch, but is provided with a second pair of contacts for the final break. The separation of the first pair of contacts introduces two reactances placed centrally one on each terminal bushing inside the oil tank, and the second pair of contacts finally breaks the circuit. At some early date the system will also be sectionalised in order to reduce the rush of power on short circuit, and in doing so reactances of relatively large value can be inserted between sections in those cases where it is not economical to separate adjacent sections permanently. This problem of switchgear for dealing with enormous rushes of power has proved one of the most difficult that has been encountered so far on the Rand and also in America. It has not yet been finally solved, nor have switches been standardised which are capable of dealing unassisted with these exceptionally severe service conditions. These remarks on switchgear apply not only to the central stations, but also to the distribution stations, and in a less degree to the consumers' sub-stations.

CONSUMERS' SUB-STATIONS.

The electrical supply at 2,000 volts and 550 volts to the consumers' premises is effected from step-down transformer stations, which are built by the consumers, but are equipped with switchgear and transformers by the power company (Figs. 13a and 13b). There are 60 of these consumers' sub-stations connected to one system, and their individual capacity varies from 10,000 k.v.a., to 2,000 k.v.a., the normal size being 5,000 k.v.a. The standard sizes of consumers' transformers are 1,000, 500 and 250 k.v.a., designed with the primary windings arranged for either 20,000 or 10,000 volts. A temperature rise of 40° C. is allowed above an air temperature of 40° C. The windings near the outgoing terminals will stand a pressure of 15,000 volts between adjacent turns. The high tension windings are tested to the secondary windings and core with a pressure of 40,000 volts, and the insulators with 60,000 volts. The transformers have been supplied by Messrs. Siemens, the Allgemeine Elektricitats Gesellschaft, and the Westinghouse Company. The transformers are exported filled with oil, thereby reducing the cost of transport and dispensing with the necessity of drying out after erection. In order to allow for the expansion and contraction of the oil each transformer tank is connected with a second smaller tank fixed on the wall of the sub-station. This expansion tank is fitted with a vertical vent pipe so that only a small surface of oil is in contact with the air, and by this means sludging is prevented. Each sub-station chamber has a short stack, which induces a natural draught and provides effectual ventilation. Double busbars are provided for each voltage. The high tension and low tension switchgear in each sub-station is arranged in different chambers with a central operating passage between, containing no "live" material. The "live" chambers are locked, and stringent regulations as to the possession of the keys ensure that no unauthorised person can obtain access; in no case is one man allowed to enter alone. The total capacity of the transformers in operation, including general transformers and coupling transformers, is unusually large, amounting at the present time to 450,000 k.v.a., but this will be increased to 508,600 k.v.a. when the transformers delivered and on order are brought into commission.

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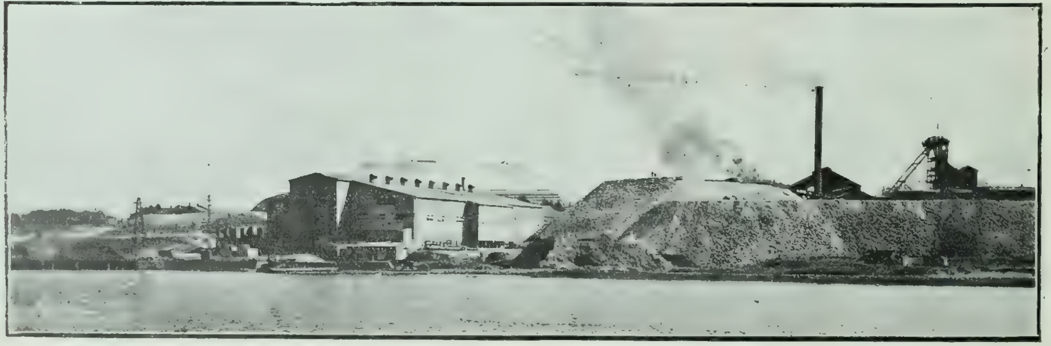

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